New Zealand JOURNAL OF AGRICULTURE

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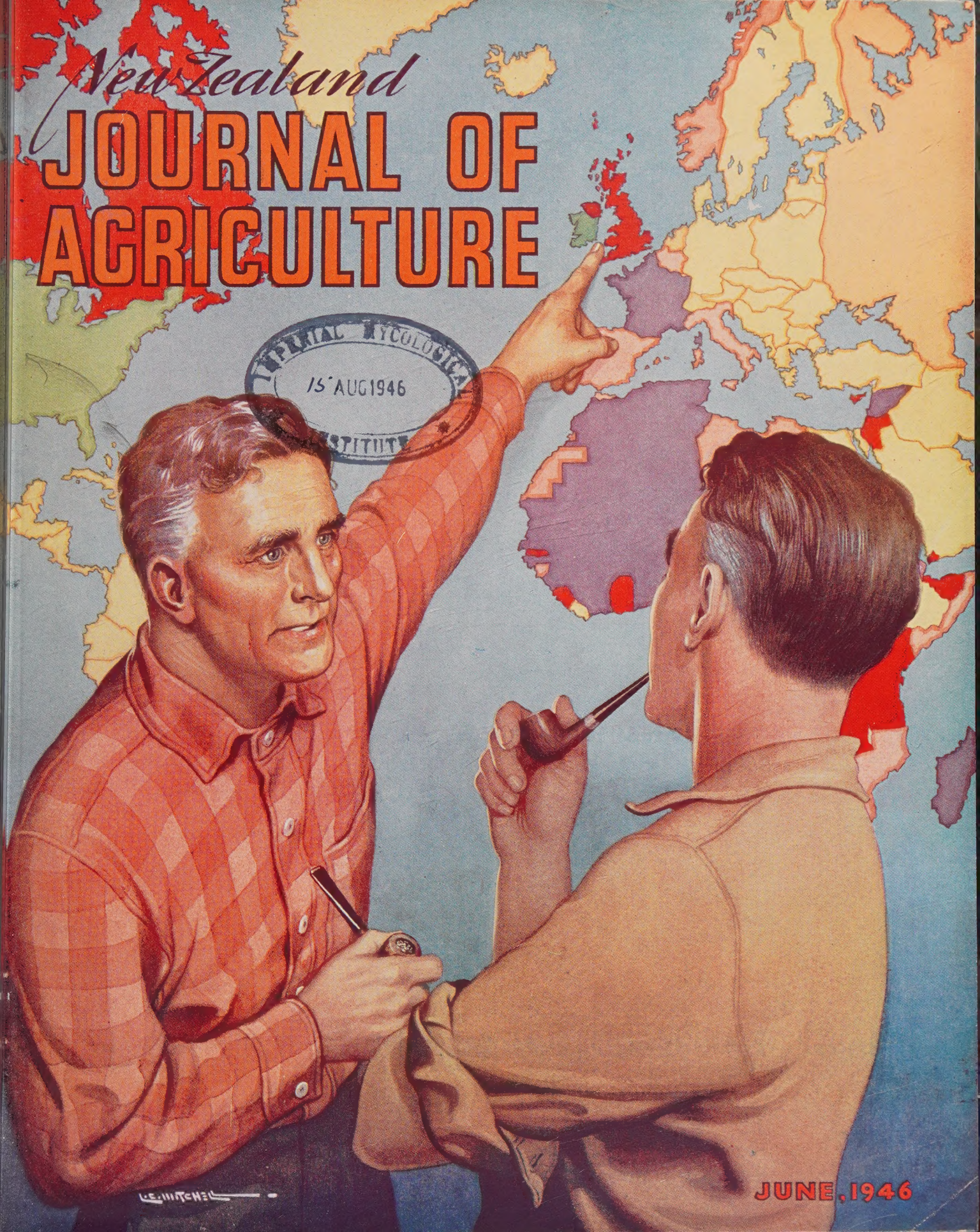

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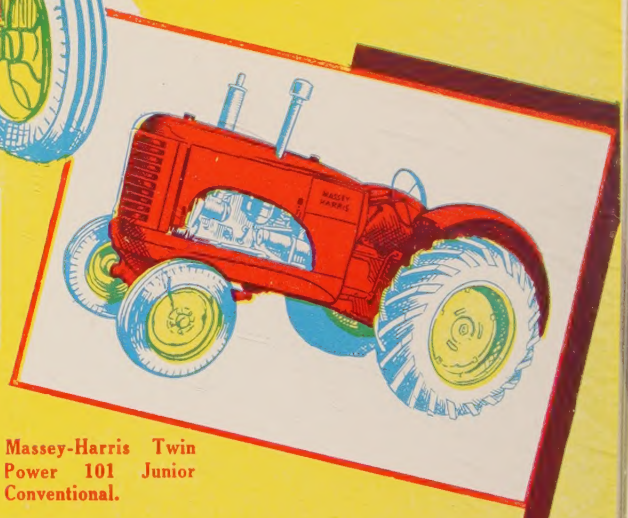
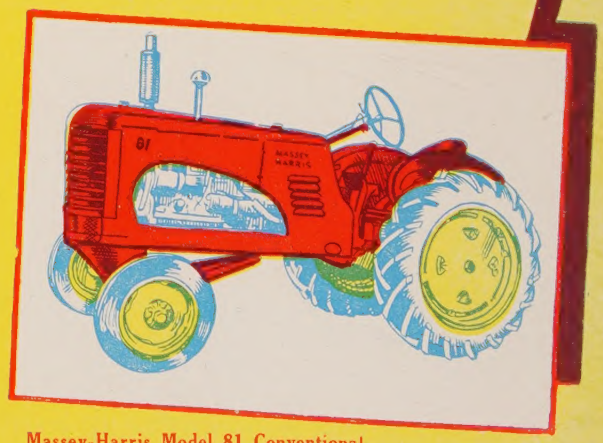


Massey-Harris Twin Power 101 Junior Conventional.



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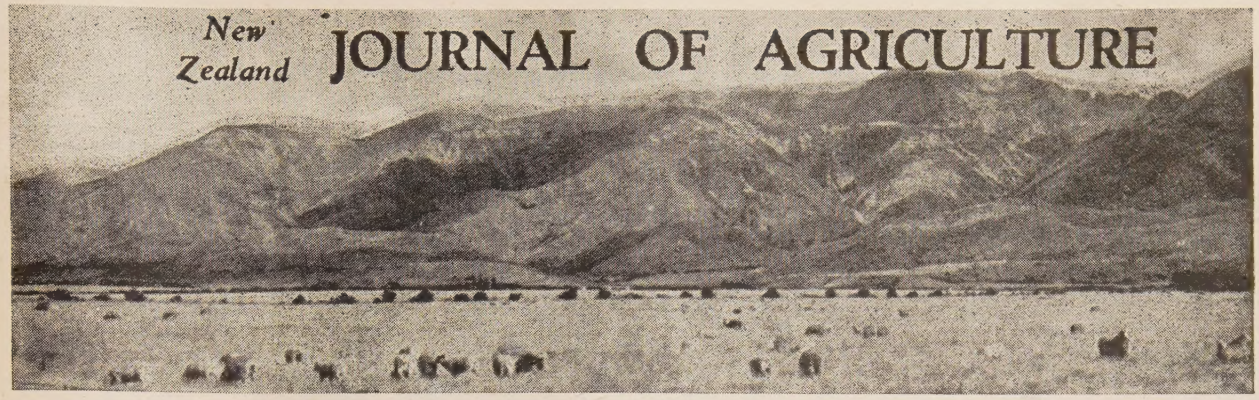


Vol. 72, No. 6. Published by Direction of Hon. B. Roberts, Minister of Agriculture. June 15, 1946.

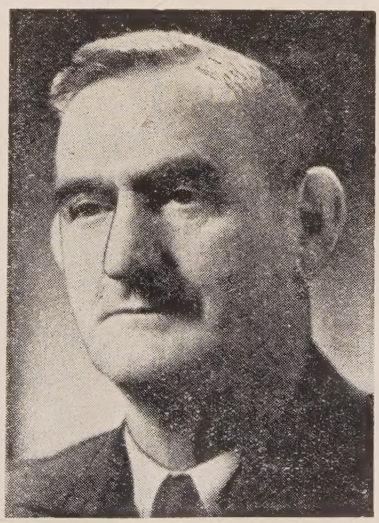
PRODUCTION PROGRAMME, 1946-47

The importance of food in world rehabilitation and the part New Zealand can play in winning the peace by a continuation of the tremendous production effort of the war are emphasised by the Minister of Agriculture, the Hon. B. Roberts, in outlining the following production programme for 1946-47.

THE road to victory was long and hard, through the vale of "blood, sweat, and tears," and while the winning of the peace may not call for bloodshed, it will certainly call for sweat and tears. This Dominion's war effort was no mean one and we contributed to the utmost of our ability. *Shall we then do less in winning the peace?*

With the cessation of hostilities the task of rehabilitation and reconstruction in the devastated countries began, and in this food must play an all-important part. Although a comparatively small country, New Zealand can play a leading part in food production, for, spared the devastation of war, our great agricultural industry is unimpaired, and we are blessed with soil and climate second to none. Our duty and our earnest desires are, therefore, to play our full part in winning the peace and in rendering to suffering humanity whatever service we can.

It is true that during the war farming in this country suffered to some extent by the lack of materials and labour, but many difficulties were overcome, and with some improvements in this respect the task should now be easier. Unfortunately, drought conditions in the North Island this summer and autumn have not been conducive to the maintenance of high production from dairying lands, but this has been offset to some extent by the good season in other parts of the Dominion.

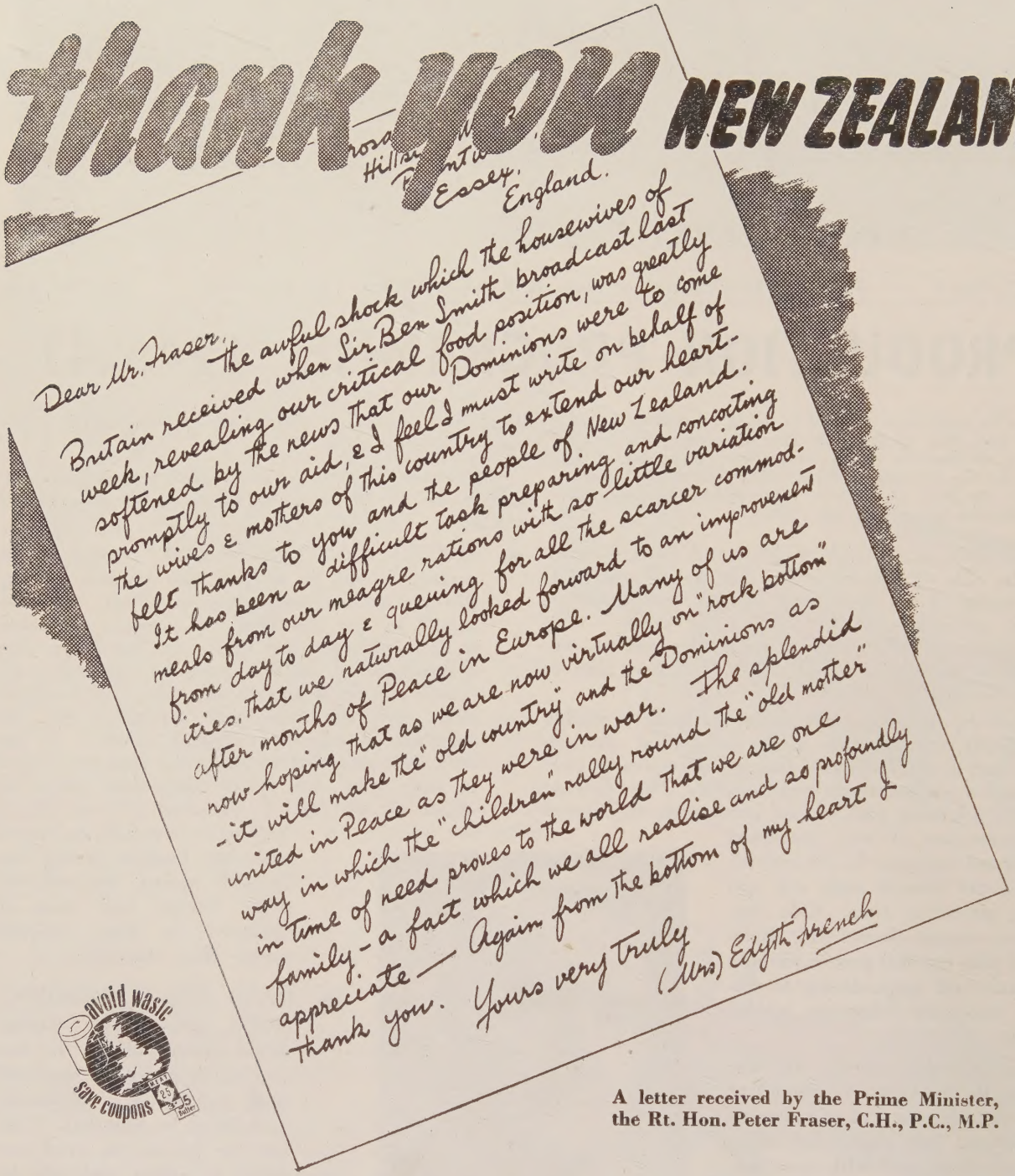


The Hon. B. Roberts, Minister of Agriculture.

Production plans have been discussed and the following are the Dominion's objectives for the 1946-47 season:—

★ WHEAT: *250,000-300,000 acres.* Sowing of this acreage would go a long way towards making this country self-supporting in wheat, and this should be our objective. We cannot contribute to the world's shortage by exports, but by growing a minimum of 250,000 acres we can materially reduce our wheat imports and thus make available from Australia additional quantities for the countries so urgently requiring wheat. It has been estimated that 20 bushels a year are needed to keep alive one person dependent solely on wheat for dieting. It therefore follows that if we find it necessary to import 6,000,000 bushels during the 1946-47 season, we will deprive Europe and Asia of sufficient to keep 300,000 people from starvation.

★ OATS FOR THRESHING: *50,000 acres.* This acreage would ensure sufficient for our own requirements for man and stock and enable a substantial quantity to be exported. Oats can be grown on land not suited to wheat and can be spring or autumn sown, so that in stepping up the area sown to oats there is an opportunity to play an important part in fulfilling the world's grain shortage.


thank you NEW ZEALAND
Rosa
Hill
Essex,
England.
Dear Mr. Fraser,
The awful shock which the housewives of
Britain received when Sir Ben Smith broadcast last
week, revealing our critical food position, was greatly
softened by the news that our Dominions were to come
promptly to our aid, & I feel I must write on behalf of
the wives & mothers of this country to extend our heart-
felt thanks to you and the people of New Zealand.
It has been a difficult task preparing and concocting
meals from our meagre rations with so little variation
from day to day & queuing for all the scarcer commod-
ities. That we naturally looked forward to an improvement
after months of Peace in Europe. Many of us are
now hoping that as we are now virtually on "rock bottom"
- it will make the "old country" and the Dominions as
united in Peace as they were in war. The splendid
way in which the "children" rally round the "old mother"
in time of need proves to the world that we are one
family - a fact which we all realise and so profoundly
appreciate — Again from the bottom of my heart I
thank you. Yours very truly
(Mrs) Edyth French

A letter received by the Prime Minister, the Rt. Hon. Peter Fraser, C.H., P.C., M.P.

SAVE FOOD ... FOR BRITAIN

FEC 15.24

★ MALTING BARLEY: *40,000 acres.* Steps have been taken to ensure that only normal quantities of malting barley are processed in this country during the coming year, so that any increase in the acreage of this crop will be available for export. Like oats, malting barley can be grown on land not suitable for wheat production.

★ FEED BARLEY: *15,000 acres.* A saving in the quantity of wheat required for stock food could be achieved by the production of additional feed barley, which can be grown over a wide range of soils. A large acreage could be sown in the North Island. This feed barley is essential to maintain our production of pig meats, and 15,000 acres would avoid the importation of feeding grain from Australia.

★ MAIZE: *12,000 acres.* Such an acreage would be a substantial increase on the area planted in 1945-46, but is highly desirable to ensure sufficient feeding grain for pigs and poultry. Here, too, a substantial saving in wheat consumption could be achieved.

★ POTATOES: *25,000 acres.* It has been suggested that the consumption of additional potatoes by the people could result in a saving in bread, with an equivalent saving in precious wheat supplies. The planting of such an area in potatoes is well within the country's ability, for during the war, when the Armed Services required large supplies of potatoes, greater areas were planted.

★ ONIONS: *1,000 acres.* This is approximately half the acreage of our best war years, and no difficulty should be experienced in having this area planted.

★ PEAS: If the expected overseas demand for pulse crops eventuates, New Zealand might well step up its acreage sown to peas. An indication has been received that up to *20,000* tons of peas would give much-needed relief to many sorely-pressed countries. Farmers are recommended to obtain a contract from a mercantile firm before growing a large acreage of this crop.

★ BUTTERFAT: *190,000 tons.* Every endeavour must be made to keep up our production of dairy products. The world shortage of fats has been frequently stressed, and we have played an important part in maintaining supplies of this important foodstuff. Despite the setbacks our dairying districts have experienced, butterfat production can and must be maintained. Additional supplementary fodder crops should be sown and the maximum amount of hay and silage saved during the coming season. Although it is unlikely that there will be the same cow numbers during the coming season, production can be maintained by feeding the existing herds better.

★ MEAT: *530,000 tons.* Every effort must be made to maintain our exports of lamb, mutton, beef, and pig meats to ensure that Great Britain's meagre meat ration will continue. Steps are being taken to export parts of carcasses that have not hitherto been sent overseas, while the export of additional meats such as rabbit meat, etc., is being arranged.

★ WOOL: *160,000 tons.* Clothing is as essential as food in the devastated countries. Our flocks may be down in numbers, but it is hoped that this figure may be obtained at next shearing. Much additional poundage can be obtained from dead wool now that additional farm labour is available.

The farmers of this country are fully alive to the world food position, and it is felt that the targets set for the 1946-47 season will undoubtedly be achieved. Starvation, want, and pestilence are bedfellows of war, and the winning of the peace can come only from the efforts of the United Nations in making available to the hungry millions of the world the necessities of life.

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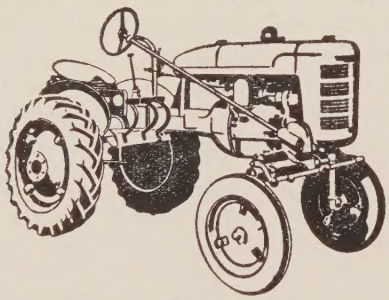
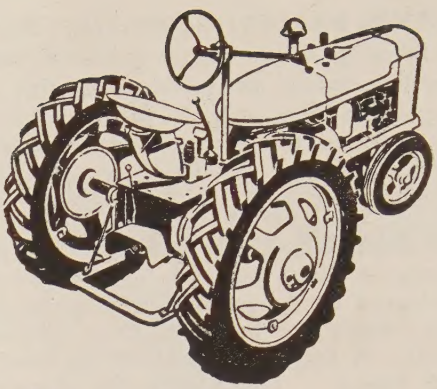
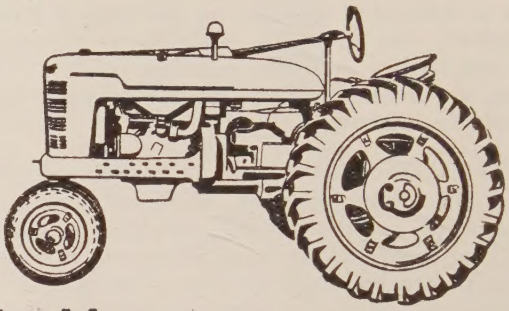


The A. and B. The smallest Farmalls, yet having a full range of the features in the larger models. Compact, powerful, economical. They've three working speeds plus a smart 10 m.p.h. for getting to the job quickly or for hauling. Both front and rear wheels are adjustable on the A. and rear wheels on the B.



The H. The three-furrow job with four working and a 15 m.p.h. speed. It has replaceable cylinder sleeves, variable governor control, and a host of other important features.



The M. The husky member of the Farmall family which sets a new standard of easy operation and comfort. There's a host of other features that make it a perfect power unit under all sorts of conditions.

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TOPDRESSING IN NORTH CANTERBURY

By J. P. BEGGS, *Instructor in Agriculture, Rangiora.*

DEPARTMENTAL experiments in topdressing of pastures with lime and artificial fertilisers have been carried out for more than 10 years in North Canterbury. The results of these experiments are summarised in this article.

DURING the war the experimental work of the Fields Division was interrupted because of urgent war work and shortage of staff. Resumption of this important phase of the Division's operations, however, will take place on a full scale in the immediate future.

A summary of the topdressing responses so far obtained from Departmental trials, as well as from general farming observations, will be of interest and value to the farming community and others in North Canterbury.

Basis of Topdressing Practice

Several factors have contributed to the present-day topdressing practice in New Zealand. A number of elements have been found essential for healthy plant growth. Some are needed in abundance; traces only of others are necessary. The three elements required in the greatest quantity—and the elements most likely to be in short supply in New Zealand soils—are phosphorus, nitrogen, and potassium. There is a deficiency of potassium in limited areas only, for example, in parts of Taranaki, but phosphorus and nitrogen are deficient in most parts of the country. Of these three major elements phosphorus and potassium merit special consideration in the application of artificial fertilisers to pastures. Under proper management nitrogen is made available to plants from the air through the agency of symbiotic bacteria which are found in nodules on the roots of clovers and related plants. That this element should be supplied per medium of clovers is desirable for two reasons. First, the high cost of artificial nitrogenous fertilisers makes their application to pastures very expensive; second, clovers in association with grasses in the sward provide a better-balanced pasture for grazing than do grasses alone. The application of some forms of nitrogenous fertilisers to the pasture tends to suppress clover growth.

Lime, by virtue of its action as a soil improver, is commonly beneficial to a balanced and vigorous growth of pasture. Its action in counteracting soil acidity renders the soil suitable for vigorous clover growth, other factors being favourable.

For the foregoing reasons topdressing experiments in North Canterbury, as well as in other parts of New Zealand, are carried out mainly with phosphates, potash, and lime.

In the experiments dealt with in this article, lime has been used in the common form of ground limestone, and potash as 30 per cent. potash salts. Phosphate has been tried in the several forms of superphosphate 44/46, serpentine superphosphate, North African phosphate, Nauru phosphate, basic slag, ammoniated superphosphate, and gafsa.

Summary of Experiments

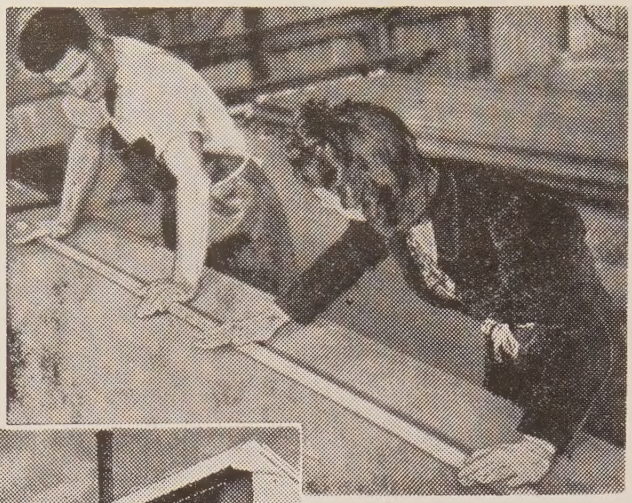
Responses have been obtained from all the forms of phosphate, but the responses of straight superphosphate and serpentine superphosphate have been outstanding. The latter form, being of relatively recent origin and appearing at a time when experimental work has been greatly curtailed, has not yet been given such extensive trial as the other phosphates mentioned.

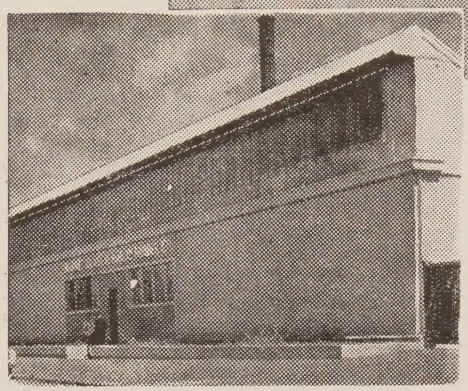
However, in the topdressing trials carried out in North Canterbury, serpentine superphosphate has given results on a par with straight superphosphate. This fact has been borne out in farming practice, as well as in crop manurial experiments carried out by the Department.

A series of eight trials of a common type used to ascertain the response to lime, phosphate, and potash yielded interesting results, results which, it may be assumed, are applicable to most soil types in North Canterbury. The trials were laid down on soil types varying from light shingly to medium clay loams, and in such a way that the responses to the lime and manures applied could be observed separately as well as in combination. The same general trend was apparent in all the experiments, namely, a marked response to both lime and superphosphate, and a negative to a depressing effect from potash. Progress reports were completed regularly for all the trials, and points from 0 to 5 were allotted for each treatment according to the response, if any, observed. A summary of these reports shows the following results:

TREATMENT.	POINTS ALLOTTED.	DESCRIPTION.
Lime alone ..	2	Fair response.
Superphosphate alone	1½	Slight to fair response.
Potash alone ..	—	Possible depression.
Superphosphate plus potash ..	1	Slight response.
Superphosphate plus lime ..	3½	Good to very good response.
Super. plus lime plus potash ..	3	Good response.
Lime plus potash	2	Fair response.

Potash, it will be noted, had a negligible to a possible depressing effect on pasture growth. The deleterious effect of this manure used alone was exemplified in the production of a harsh, unpalatable growth. Browntop and hairgrass were prominent species, and clover growth was not encouraged under this treatment. It is interesting





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to note that potash maintained its depressing effect when in combination with lime and superphosphate. Although over all the trials the depressing effect was very small, on individual areas this effect was more apparent. That the use of potash for pasture topdressing in North Canterbury is not warranted is obvious.

Superphosphate produced a marked response. The effect of this fertiliser was to increase clover growth, improve the colour and health of all the pasture species, and to encourage the preferential grazing of stock on the plots concerned.

Lime showed a slightly more marked response generally than superphosphate. The type of response is practically identical with that described for superphosphate.

The lime plus superphosphate combination gave better results than any other treatment, the response, as indicated by the foregoing markings, being from good to very good. The combination is obviously greatly superior to either ingredient used separately. The addition of potash to the mixture was not beneficial. There was, instead, a slightly depressing effect.

Farming Experiences

Farmers in North Canterbury, therefore, should concentrate on topdressing pastures with lime and phosphate. Apart from the experiments previously described this is further emphasised by farming experience in the district. Farmers who have harvested a sack of white clover seed to the acre recently as a direct result of liming a pasture have no doubts about the value of lime.

The writer is acquainted with an instance where, inadvertently, through the running out of lime on a farm, a portion of a paddock received no dressing, the remainder of the paddock having received approximately 1 ton per acre of carbonate of lime. The following year a crop of white clover was harvested from the dressed area, while on the unlimed portion practically no clover growth was apparent.

On light land in the Oxford district the response of subterranean clover to liming has been marked. Details of an outstanding example of such a response are as follows: A 12-acre paddock was sown down to rape and grass in January, 1942. Approximately 1 bushel of pedigree perennial ryegrass, 1lb. white clover, and 1½lb. subterranean clover per acre were sown. Carbonate of lime was applied to the larger part of the paddock at the rate of ¾ ton per acre shortly after the rape had appeared. An area of about four acres in the centre of the paddock received no lime at this stage. In the following harvest season a crop of

grass seed was taken, but no difference was noted by the grower between the grass on the limed and on the unlimed areas. Later that year, however, a marked difference in subterranean clover growth on the two portions became apparent, and preferential grazing of the limed area started. In November, 1943, a further area was limed at the same rate, and in June, 1944, the remainder of the unlimed area was limed, with the exception of a small area which was left as a control.

At present the area which received the initial liming is outstanding in its mat of clover growth, healthy appearance, and extremely closely-grazed condition. The portions subsequently limed are rapidly improving in subterranean clover growth and show quite a degree of preferential grazing compared with the unlimed area. The latter is practically devoid of any clover growth, the herbage consisting of rough growth of browntop and hairgrass. It is practically untouched by stock.

Similar, though generally not so marked, responses of subterranean clover to liming have been observed in the Oxford district, and in other parts of North Canterbury.

Lime is much slower acting than superphosphate but it maintains its effect over a considerably longer period. A striking example of the carry-over effect of lime has been observed in the Cheviot district. In the autumn of 1934 two strips in a paddock of young grass were topdressed with lime at the rate of 1 ton per acre, while the rest of the paddock received no lime. Cropping of the paddock started in 1936 when a crop of wheat was taken. This was followed by another crop of wheat, three crops of oats, and one of potatoes. Following the potato crop, the area was again sown to pasture in the autumn of 1942. In 1943 the effect of the 1934 liming was still plainly visible. The limed strips stood out by virtue of greatly superior clover growth and preferential grazing, the better sward on the topdressed strips being closely grazed, while the rest of the paddock was characterised by a long ryegrass stubble.

Outstanding Responses

Phosphate has also given some outstanding responses in farming practice. For example, a paddock had been in subterranean clover for a period of eight years and during that time it had received no topdressing. A dressing of superphosphate at the rate of 1cwt. per acre was then applied, but owing to the running out of the manure before the paddock was covered, a small triangular portion in the centre was left unmanured. The response to the superphosphate was marked.

The subterranean clover growth on the manured area became very vigorous and induced preferential grazing. The triangular portion which had received no manure was neglected by stock; it consisted of browntop rougnage with very little clover growth.

Responses to both lime and phosphate will be obtained on almost all soil types in North Canterbury. Minor exceptions are the rich alluvial soil in the vicinity of Bells and the heavy alluvial type in the Coldstream, Kaiapoi areas which show practically no response to lime and phosphate applied as a topdressing to pasture, although a response to the latter is likely to be present though not easily discernible. Other smaller areas throughout North Canterbury, such as rich alluvial soils in the vicinity of rivers, react in the same way. This was borne out by a Departmental experiment with lime and phosphates on rich land in the vicinity of the Lottery River. On this trial no benefit was noticeable from the application of various phosphates and carbonate of lime.

Important Points

Lime and fertilisers should be used so as to yield maximum returns. This should be emphasised at present when supplies are rationed. The topdressing procedure which follows will, it is felt, assist farmers in North Canterbury to avoid waste, and to obtain full benefit from available supplies of fertilisers.

On North Canterbury soils, with the few exceptions previously mentioned, maximum returns are not obtained from phosphates on unlimed areas. Lime must be applied either before, or in conjunction with, phosphate. Further, in applying lime in the initial dressing light applications, such as 5cwt. per acre, are wasteful. It is recommended that at least 1 ton per acre be applied as the initial dressing. As lime leaches from the soil, and is also used by stock for bone formation, it is necessary to make subsequent applications in order to maintain the soil at the appropriate state of base saturation. For this purpose smaller dressings of say, 10cwt. per acre applied every three years, would be satisfactory in most instances. This recommendation is for the liming of pastures which, it is expected, will be left down for relatively long periods, for example, subterranean clover pastures on light stony land. For short-rotation paddocks which are left in grass for a period of from four to five years only it would be satisfactory to waive the routine of liming every three years. A dressing of 1 ton per acre applied to the seed-bed before each pasture seeding would give good results.

Dressings of lime applied in the late autumn or early winter usually produce the quickest results. However,

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with the lime supply position as it is, it is not possible for all farmers to have their supplies available at this time, and it is fortunate, in view of this limiting factor, that good results are obtained from the application of lime at any time. A further point to note in the use of lime, in view of its relatively slow action, is that when sowing down new pastures it is preferable to make the application to the prepared seed-bed before seeding the grass, rather than when the pasture is established. If the lime is lightly harrowed into the seed-bed its effect will be apparent much earlier than if it were applied to the growing pasture.

With phosphates, it is recommended that serpentine superphosphate or straight superphosphate be applied at the rate of from 1cwt. to 1½cwt. per acre per annum. This light dressing applied annually is preferable to a heavier application made every second or third year.

The best time to apply phosphate is in the autumn—March or April. This encourages growth in late autumn and early spring, when stimulation of pasture is particularly desirable.

In the topdressing programme a point that concerns the application of both lime and fertilisers is the selection of pastures to be topdressed. With the present limited supply of phosphate, in particular, it is naturally possible to topdress a proportion only of the pastures on any particular farm. The best pastures on the farm consequently should be selected for attention. Although some response is likely to be obtained from the topdressing of almost any type of pasture with lime and phosphate in North Canterbury, the most payable return will undoubtedly be obtained when a sward which contains good species of grasses and clovers is treated. This fact is very well demonstrated by the following:—

Several applications of carbonate of lime at the rate of 10cwt. per acre and superphosphate at 1½cwt. per acre were made to a ½-chain strip running at right angles across several strains of subterranean clover in adjacent plots. On the Dwalganup strain (an early-flowering type that has proved unsatisfactory in New Zealand) the topdressing had little effect, the plot being neglected by stock, and consisting mainly of browntop roughage. The Tallarook strain (a good type of subterranean clover) in the adjoining plot, however, responded notably, the plot being well grazed and the clover growth vigorous.

A farmer wanting maximum returns from his outlay on topdressing must, in the first instance, sow his pastures down with good strains of grasses and clovers. The only sure method of doing this is to sow Certified seed. Let the maxim be: Sow reliable strains of grasses and clovers and maintain them at maximum production in the sward through judicious topdressing practice.

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

July 1—"Current Farming Problems," by E. B. Glanville, Instructor in Agriculture, Auckland, and P. S. Syme, Instructor in Agriculture, Warkworth.

July 8—"The Soil Survey in Relation to Topdressing in North Auckland," by E. H. Arnold, Instructor in Agriculture, Whangarei.

July 15—"The Experimental Approach to Farming Problems," by P. Lynch.

July 22—"Young Farmers' Club Session," by a representative of the Eastern Bay of Plenty District Committee.

July 29—"Problems of Peat Development," by J. R. Murray, Instructor in Agriculture, Hamilton.

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WINTER BEEF PRODUCTION

THE high prices for prime butchers' beef in city markets during the late winter and early spring are frequently remarked on by graziers, who feel that the production of out-of-season fat cattle is an undertaking well worth considering. This article by A. T. Shannon, Field Economist, Hamilton, describes the farm management methods of suppliers to the Westfield and Frankton markets, and the study shows that there are very special factors involved in this type of production which must be appreciated fully before this business is undertaken.

AN analysis of prime bullock prices at Westfield over eleven years from 1935 to 1945, shown on the next page, provides some interesting information. Averaged over that period to illustrate the week-to-week position, prices show, on the whole, fair stability from January to the middle of July. However, a slight rise actually takes place during February, followed by a sharp decline of about £1 per head from the second sale in March. After March there is a gradual recovery to the middle of July, when prices regain January levels.

From mid-July a steep rise in prices reaches high levels about the end of August. The period of highest prices covers eight to ten weeks until towards the end of October, and this is the principal market which winter beef producers seek to exploit. Following this period there is a steady decline to the end of the year.

This eleven-year average shows that August is the critical month, where the ability to hold cattle an extra week or two can make all the difference between just fair prices and high prices. Also, as compared with the fairly stable prices of the first six months of the year, an increase in prices to the extent of about 19 per cent. to 26 per cent. on the average can be expected by a producer who meets the premium eight-week period. These actual figures do not support the commonly-exaggerated impression of extra high returns for the winter beef market over a period of several years.

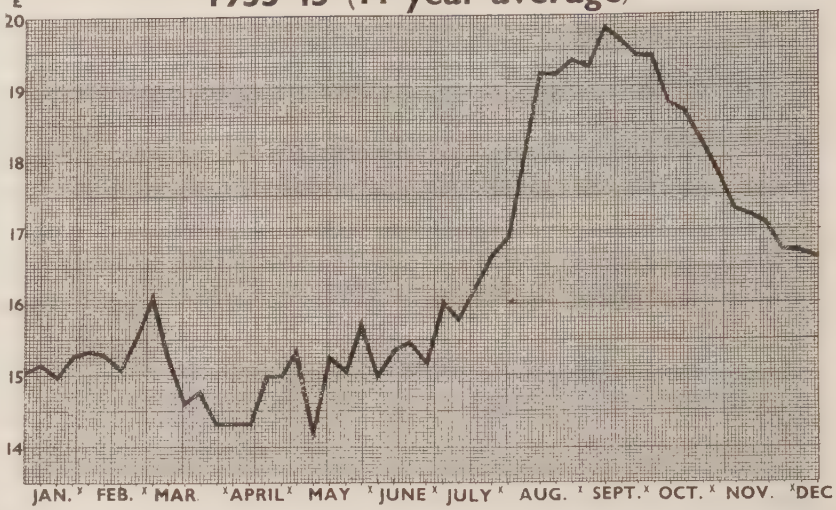
A study of the movement of prices for individual years, with special reference to the premium period, emphasises the limited value of speaking about what happens in the normal course of events or on the average. No producer can really count on the normal thing happening.

Strangely, the movement of 1945 prices at Westfield was fairly true to type, except that the rise in fat values

was accentuated by the increases in schedule prices. In 1944 there was hardly any peak of high prices until late November to early December, about two months later than usual The 1943 prices were remarkably stable until August, when they sky-rocketed to the end of September, firmed, and crashed a month later. Unusually high prices ruled for three sales in March, 1942, and these levels were not reached again until August, but the real high-price period did not eventuate until the end of September, and then lasted barely a month. There were no high March prices in 1941 and the premium period showed only a moderate rise. Out-of-season prices were a month earlier in 1940, but were almost on the eleven-year average in 1939. If the first half of 1938 showed most erratic price change, the second half was quite normal, and the position was the same in 1936, except that, though premium prices eased after a few sales in September, they lasted until December. On the other hand, 1937 was normal.

It is probably misleading to discuss an average of eleven years, because only three years came close to the average movement of prices. Obviously the market prices from month to month give very little clue to the probabilities six months ahead. Most cattle for fattening are bought and held for at least that length of time, and it is out of the question to plan for the production of prime cattle with any certainty as to the period or degree of premium prices. One can say only that late August and September and early October are usually the months of highest prices, and that winter beef producers will probably secure prices 19 per cent. to 26 per cent. better than for seasonal fattening.

PRIME BULLOCKS: PRICES AT WESTFIELD
1935-45 (11-year average)



Saving Winter Grass

The key to winter cattle production is in managing the stock so that there is enough grass to bring the cattle to fat or forward condition by late autumn, plus a reserve for topping off in winter. This extra growth is secured mainly by reduced summer stocking, principally sheep, and for that reason it is hardly possible to have maximum fat lamb production and to fatten winter beef consistently as well.

It is claimed that about two store cattle can be carried through from July to October, compared with one fattening beast. Therefore, to fatten successfully for the spring markets, the number of cattle wintered has to be kept within restricted limits and the common tendency to overstock severely curbed. Slight overstocking quite often leads to a shortage of feed, which compels quitting cattle within a week or two of the highest price period. In short, normal carrying capacity must be sacrificed sufficiently to get the best out of winter fattening.

Preparation for the winter begins when the lambs are drafted and the ewes culled. The normal routine is to hard graze the breeding ewes to get them into condition for tupping, and this is the time to ensure that paddocks are reserved for cattle in the winter. There are two important considerations. The first is to avoid paddocks that may cut up severely through a winter concentration of cattle. The second is to manage the stocking so that the cattle are not fattened at the expense of the ewes during lambing.

Conditions vary in different localities. Meadow soils which develop on low-lying flats where the water table is near the surface provide good winter grazing. Areas of meadow soils are found in the Waerenga Valley, near Taupiri, and to a limited

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extent near Kiwitahi. These meadow soils poach badly in winter, and yet are remarkable for good winter and early spring growth of grass. Sheep are not carried to any extent because of footrot, and dairying is difficult without a suitable winter run-off, but the conditions are ideal for out-of-season beef production provided the paddocks are stocked lightly. However, it is essential for the price of the land and financial circumstances of the farmer to be in line with returns from beef cattle, otherwise a farmer may be forced into dairying under conditions that are anything but pleasant.

Farms that enjoy a warm winter and early spring are well adapted to winter beef production, because there is less danger of running ewes and lambs short of spring feed. However, these farms have the alternative of early lamb production. When premium prices are offered this may be more profitable and the market more certain than for out-of-season beef.

The principal producers of winter beef have been running cattle for many years. In a number of cases the circumstances of winter production in the past were rather different from the present systems of management. The common method of breaking in the land was to crop with swedes for a season or two before sowing down to grass. After bringing cattle through the summer and autumn on rough growth, they were put on to swedes in late autumn and winter with a run-off, and finally topped off with the new pasture in early spring.

With the completion of farm development cropping has practically ceased, and grassland farming is now the rule. The use of topdressing and hay feeding provided a substitute for cropping at first, but at present only a limited amount of hay is fed to the mature cattle. More reliance is placed on growth saved for the winter by lighter stocking methods, which have become possible as farmers have become more firmly established financially. Under heavier winter stocking management, up to an acre of hay is saved for every three beasts.

Buying Stock

A great deal of the profit from beef production depends on the successful buying of store stock. In this the larger farmer has an advantage. The size of his operations enables him to establish a wide field of connections with principal breeders and to draw to the full on the services of stock firms. Buying say 100 cattle at a time makes possible the organising of a stock drive and the exercising of personal supervision over droving, transport, and grazing. It is typical to find the largest fatteners securing 10 per cent. or less of their cattle in the stockyards. Buying from the yards is satisfactory only when the history of the cattle is known.

Smaller fatteners having to rely on this source of supply can select their stock in pen lots according to their special requirements, but costs are loaded with commission and handling charges. The opinion has been expressed that large-scale arrangements for purchasing store cattle can save up to £1 a head. However, the selection and purchase of store stock is to a large extent left in the hands of a stock agent or freezing company representative, on the strength of assured business with the fat cattle.

Though store cattle may be bought at practically any time from spring to autumn, the greatest demand is in the spring and prices are highest then. Farmers in suitable localities for early spring growth are sometimes able to buy to advantage just before the heavy demand sets in, but it is always difficult to judge store market prices in advance and decide on the best time to buy. Quite a number of spring-purchased cattle will be held for winter fattening, but some producers prefer to quit them as they become fat and buy stock in the autumn suitable for marketing within the next four to six months. During recent years it has been usual to reckon on a net margin of profit of £2 to £3 10s. for summer fattened cattle, and about £5 to £7 for out-of-season fattening.

Most of the stores for winter fattening are bought as 2½-year cattle or older, for mature animals will stand hardy treatment if necessary where younger stock will deteriorate in condition. There is also a preference for heifers, which appear to fatten better in winter than steers.

In marked contrast to the general practice one farmer who breeds about half his cattle aims at getting stock off fat at 20 months, in addition to buying yearlings to fatten for the winter. This policy demands adequate hay feeding and very careful attention to stock management and carrying capacity. It is essential that the young cattle have no setbacks and that there is always a reserve of grass for contingencies.

Winter Fattening

Principal producers agree that only the most thriving cattle should be held over for winter fattening. When a line of stores is bought for this purpose, it pays to select the best and sell the tail ends at a loss if necessary.

The small farmer will buy only forward pens of stores from the autumn sales for this reason. There is more profit in concentrating on the best cattle than in trying to fatten everything for the high-price markets. Though conditions sometimes compel it is generally considered unsatisfactory to buy in spring, quit all the fats possible in autumn, and attempt to fatten some of the balance in winter. These will be the least thriving, and some may be so slow to fatten that the high-price market will be missed.

Extra heavy prime bullocks are often marketed in the winter, but they are not ideal for the trade and will sell for less a hundred pounds than lighter beasts. With the rationing of meat, the lighter, meaty animal is preferred to the heavy fat ox. It is not possible to say what class of beast is most profitable because of the fluctuations of the store market among other factors. At present several fatteners assert that Jersey-cross cattle will show the best returns because of their cheapness as stores, the shortage of winter fat cattle, and the higher carrying capacity with this stock. However, most cattle men dislike handling this poor class of beef, and there is also the likelihood that they will be the first cattle to sell at a discount on a full market.

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Mixed line of steers, some fat, some forward, and some in store condition ready for drafting up for winter fattening.

WINTER BEEF PRODUCTION

Though the point may be subject to some discussion, it is generally admitted to be impossible to forecast accurately the weekly variations of market prices, and gambling on the market is an unsound practice. Stock agents will usually advise about the market position to the best of their knowledge. The most reliable policy is to provide a regular supply of fat stock to the markets, so that the bad averages out with the good. The farmer who sends only two or three trucks to the winter market risks striking unprofitably low prices each time. Westfield is often preferred to Frankton, because the larger market is less easily glutted and prices tend to remain more stable.

Economics of Winter Beef

The production of winter beef as a principal undertaking is by no means as profitable as it may appear. For the man starting out, or with limited finance, the order of preference is dairying, fat lamb production, and lastly beef fattening. The majority of winter beef producers are men who are now well established financially and who have their properties freehold. They admit that it would hardly be possible to undertake this production, make a living wage, and pay interest on capital. Cattle are run because the work is congenial, labour and other requirements are a minimum, and maximum financial returns from the farm are not of paramount importance. Moreover, considerable finance is involved; reserves are essential to withstand the setbacks that are liable to occur, specially in bad seasons or periods of declining prices.

The greater part of the winter beef supply comes from farms of 700 acres or more, always on good-class flat to rolling country, the majority of which is ideal for fat lamb production or even dairying.

The smaller farmer, or the man who needs to get the most out of running cattle, usually prefers to buy forward stock at all times. He holds them from four to seven months—less if possible—and quits them fat. Thus it is more possible to adjust carrying capacity to seasonal growth than when cattle are held for a longer period. A rapid turnover of cattle, plus hay feeding at half a ton or more a beast wintered, and the saving of pastures, appears to be the most profitable method of management. But this requires expert buying in small lots, with a careful eye to margins. An inexperienced man could readily incur severe losses.

To reduce expenses it is advisable if possible to sell fat stock on the farm. To do this, satisfactory connections have to be established with particular butchers to meet their special requirements. In this way selling and droving expenses, amounting to about five per cent., may be saved. For preference a small farmer needs to be handy to principal saleyards to make a success of winter beef production.

A WAIKATO FARM

One farm devoted to fat lamb and winter beef production is a 777-acre holding in the Cambridge district. About half flat to easy rolling country, and half steeper, the whole farm has been ploughed. The soil for the most part is a silt, but varies between a silty clay on the hills and a loamy silt on the flats. It is readily cultivated on all but the steeper grades. This country was once covered in bracken, fern, and manuka. During the stage of breaking in about 150 acres a year were under the plough, and conditions were ideal for producing beef off turnips and grass. The completion of breaking in and the advent of chemical fertilisers have led to almost complete reliance on grass, for this pasture is very responsive to topdressing. Only about ten acres of crop are now grown annually for the ewes in the winter.

The farm is in the shape of a hollow facing north, and is well sheltered naturally from the prevailing cold winds. Nevertheless, the farmer feels that there are insufficient shelter belts and is planting more Lawsoniana hedges, for the absence of wind in winter is more important to fattening cattle than freedom from frost. The lie of the land and the soil type make the farm comparatively warm in winter, and ensure a pasture growth in autumn and early spring that is not necessarily found on other farms in the district. The holding is ideally suited to winter fattening.

In addition to being favoured with a suitable locality, this farmer has the benefit of accumulated family experience, for his father also fattened cattle for the Westfield markets sixty years ago. One valuable outcome is that butchers are well aware of the circumstances in which cattle are fattened and are prepared to bid more freely. Moreover, connections have been established with buying and selling agents, whose co-operation and advice on both store and fat cattle markets are an important side of the business.

Fat Lambs or Cattle?

Fat lambs are the principal source of revenue, but the farmer has studied the alternatives of fewer sheep and more cattle. This country could run four ewes to the acre with 200 cattle or fewer, but these would have to be bought at the usual time, in spring, and sold mostly in autumn. In normal seasons, under the present system, three sheep are carried to the acre with 400 cattle, half of which are sold fat during the premium-price period from July to early November. Fortunately in this dry season cattle are down to 280.

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Views of a Waikato farm specialising in winter beef production, showing two and a half-year steers now being grazed for the coming winter and early spring. Note the shelter.

Weighing up the evidence, the conclusion is reached that a high sheep-carrying capacity with minimum cattle requirements is possibly more profitable, but present arrangements come closer to ideal farming. The pastures reach a higher standard and are healthier for both sheep and cattle. Improved consolidation because of cattle tramping is a further consideration, and altogether the farm is maintained in great heart.

To what extent this affects net return is not easy to suggest. On the other hand, there are additional expenses caused by damage to fences, gates, bridges, and ditches.

Store cattle are bought early—just before the main demand in spring sets in. This policy is possible because of the early spring growth, and results in a saving of possibly 10s. a head on prices ruling a fortnight or so later. Most stock are bought on the paddock from the Gisborne districts or the King Country in preference to the stockyards, though special lines of store cattle at nearby sales may be bought at any time during the growing season. A useful point in buying East Coast cattle is that the normal drive of six weeks can be slowed down, or the stock even grazed out, till it is more convenient to receive them on the farm.

Till the lambs are got away the sheep have priority on the pastures, cattle being brought in only where it is necessary to control rank growth. About January drafts of cattle are brought on to the better paddocks for fattening, and are quitted from about March onward. Usually there are three drafts of up to 60 each, and the cattle are run at this stage at about a beast to the acre or better. Advantage is taken of autumn growth to topdress and shut up paddocks for winter fattening. After grazing these paddocks will mostly be kept for lambing, in the case of the handiest, and later for ewes and lambs, and will show first-class spring growth. The steady reduction of fattening cattle numbers by August fits in well with lambing requirements.

In general, the policy is to bring the cattle for the winter market up to very forward condition by autumn and then to hold or increase their weights till they are sold. During the winter fattening is confined to the warmer, more sheltered flats where there is some pasture growth even at this period, but carrying capacity of the fattening drafts is down to almost a beast to two acres. At a later stage a few twin lambs may be run with these cattle.

Each year about 2,000 bales of hay are saved for feeding mainly to the store-conditioned stock till September, these cattle being grazed harder on some of the rougher areas. Careful attention has to be given to stock management so that the question will never arise of stinting sheep for the benefit of cattle or vice versa. When lambs require the best grass the cattle are on hills at the back of the farm, and in autumn and winter the ewes are off the cattle-fattening paddocks.

There is one paddock on the flat on which ewes and lambs consistently fail to thrive for no apparent reason. It is grazed only by cattle and may be cut for hay. Having roughly half the farm devoted to cattle for one part of the year and to sheep for the other part serves to keep parasitic infestation to a minimum, and is a valuable contribution to stock health.

Variety of Topdressing

Liberal topdressing in past years has resulted in the maintenance of a good pasture sward, and the aim has been to cover at least two-thirds of the farm each year with 3 to 4cwt. of fertiliser. In endeavouring to vary the class of topdressing from year to year, careful records are kept of the treatment of each paddock. Superphosphate, bonedust, basic slag, compounded slag, serpentine superphosphate, and Seychelles guano have been used. Recent pasture mixtures at 31lb. to the acre have contained 14lb. of cocksfoot, partly as an experiment to control eczema should that possibility arise. Careful attention to topdressing and pasture management is obviously important in exploiting the early growth conditions.

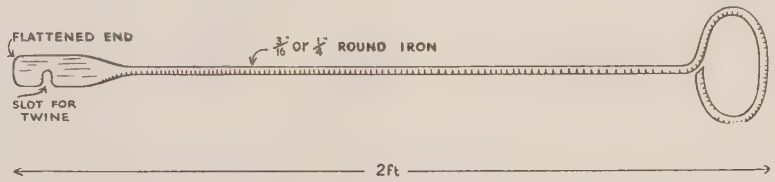
That beef production is liable to wide variation in profits from season to season is borne out by this farmer's figures. Though these do not allow for some changes in the stock numbers on hand, net returns (the difference between purchase and sale price, less commission, transport, and drovers' charges) for three recent seasons are £639, £1,649, and £2,065. This is only one aspect of an undertaking which obviously must be considered from many different angles before the decision is made to launch out on extensive winter fattening.

Because this class of enterprise is not normal to the usual run of farming conditions, it is clear that particular requirements of finance, farm management, stock experience, and locality are essential to cater for the specialised out-of-season beef markets. If there were not the few men fortunately placed in these respects, winter beef would be in even shorter supply than it is at present.

DEVICE FOR TYING HAY BALES WITH TWINE

DURING the past few years baling wire has become increasingly difficult to obtain, with the result that much of the baled hay crops had to be tied with twine. To meet this position on his stationary hay baler, Mr. J. V. Hardy, who is farming in the Paeroa district, made a device for threading the twine through the bales.

It consists of a rod with a loop forming a handle at one end. The other end was flattened after being heated, and a slot to take twine was cut into one side. The over-all length of the device is about 2ft.



The twine is placed in the slot, the rod pushed through the compressed hay near one block, and the twine pulled through. The rod is withdrawn and inserted near the next block, where the twine is again placed in the slot and drawn through to the side from which the operation was started. Finally the twine is drawn tight and tied. This operation is carried out for both top and bottom ties, a separate ball of twine being used for each.

The device is simple but effective, and Mr. Hardy has consented to the publication of this note in the hope that it will be helpful to other farmers.

—*C. WALKER, Instructor in Agriculture, Thames.*

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Pruning Bearing Fruit Trees

IN the third article of his series on pruning, A. R. Grainger, Orchard Instructor, Christchurch, discusses the treatment of bearing and declining fruit trees. In previous articles he dealt with the pruning of young non-bearing trees.

BEFORE dealing with individual kinds and varieties of fruit trees, the following rules may be taken to apply in a general way to the pruning of all bearing trees:—

1. Before starting pruning operations the condition of each tree should be observed. If growth has been vigorous the previous season, prune lightly. As growth decreases prune more heavily. A tree in full bearing should make 12 to 15in. of growth each year and nearly as much lateral growth.
2. All broken and diseased branches should be removed. Fireblight, mildew, borer, die-back, and brown rot are typical infections requiring removal as an important part of the control programme.
3. When this is completed the fruit-bearing laterals and dominating leaders should be spaced to maintain steady growth.
4. Where there is an abundance of fully-developed fruit-buds or spurs, a comparatively heavy thinning out is desirable, because, with a good crop promising, thinning of the crop can be done by pruning, saving time later.

Golden Delicious graft headed back after first year, but unpruned after the second. Note good laterals on first-year wood, but on the unpruned portion lateral development is best at the top, and much weaker lower down.

Golden Delicious graft pruned moderately for three seasons. Note good lateral development.

Stone Fruit

Peaches and Nectarines.—The object with the bearing tree should be to maintain a supply of new fruiting wood each year in a position easily accessible at harvesting time. The natural tendency is for the fruiting wood to grow more toward the top of the tree each year, leaving the lower parts more or less bare. Drastic heading-back of the leaders will bring into action dormant buds lower down and cause new growth to develop. Because of the danger from silver leaf blight, hard cutting of heavy limbs should be avoided wherever possible. Lack of light and the overshadowing of lower laterals by those higher up tends to reduce the quantity of fruiting wood at the lower levels. The aim should be to keep well-spaced limbs and laterals so that fruiting wood will develop. As peach trees grow older, it is best to adopt a system of pruning the lateral wood to maintain vigour. Peach laterals weaken if allowed to extend for several seasons; therefore, where new wood is produced further back they should be shortened to this growth.

Japanese Plums.—Japanese plum trees, not being dependent for a crop on the production of new wood each year, are frequently allowed to become weak in fruiting wood, with the result that even with a thinning of the fruit itself the size of that remaining is small. Careful attention should be given to thinning at pruning time, and by a systematic cutting-out of the old fruiting wood and the retention of comparatively new and more vigorous laterals larger fruit can be produced. This applies to all varieties, but response to this treatment is particularly noticeable in the Burbank variety. Plums and apricots, though at times blossoming on one-year-old wood, usually bear on short spurs on two-year wood or older. However, the useful life of these fruit-spurs is only four or five years, and their renewal—though not necessary annually,

as with peaches and nectarines—should be more frequent than with apples. About a quarter of the fruiting wood should be removed and replaced annually. Another type of weak wood is the branch that has been allowed to extend for several years and, having fruited well, has eventually failed to make any new growth. Hard cutting-back is required, leaving not more than a third of its length; provided the tree is healthy new growth may be expected the following spring.

Burbank plum wood: On left declining fruit-spurs which should be removed in favour of young, vigorous type on right.

Apples

The habit of growth of apple trees, and therefore the pruning technique, varies with the variety. Some varieties are tip-bearers, such as Rome Beauty and Irish Peach; others are free-spurring varieties such as Cox's Orange Pippin, Delicious, Golden Delicious, Gravenstein, and Sturmer. Varieties such as Granny Smith may be described as of a habit between the other two types—neither tip-bearers nor free spurring.

Cox's Orange Pippin develops fruit-spurs freely and produces laterals readily on two-year-old leaders whether pruned or left untopped. In good land it is often difficult to get this variety to settle down to cropping in proportion to its size. Lateral growth should be spaced out and those remaining left uncut for a year. At the following pruning, do not cut hard back into two-year-old wood or the remaining buds will often fail to respond and do not set fruit well. The encouragement of long laterals gives the best response with this variety, but a proportion of these must be replaced each year.

Delicious, Golden Delicious, and Kidd's Orange Red also produce fruit-spurs freely, and laterals develop well with light cutting of the leader growth. When required these laterals may be left unpruned for a season and then shortened into two-year-old wood the following year.

Dougherty is not such a heavy spur or lateral producer. Long pruning is not recommended with this variety; the annual growth should be cut back fairly hard each year.

Jonathan produces spurs fairly well on healthy laterals. This variety is very subject to powdery mildew, and at pruning time care should be taken to remove all infected shoots. Generally prune hard and aim at maintaining upright leaders.

Irish Peach and Rome Beauty become tip-bearers unless the laterals are pruned back to three buds each year to build up a more compact fruiting system. With the tip-bearing type laterals in the early stages bear fruit only at the terminal bud, but as they bend over under the weight of this fruit another bud may develop into a fruit-spur at a point near the apex of the bend. A new shoot will often form at this point, and at the subsequent pruning the lateral may be cut back to the new shoot, making it more compact.

Sturmer produces fruit-spurs very freely, but because of its consistent heavy cropping it is liable to become stunted in leader growth. The leaders should be pruned each year, and hard cutting is usually necessary, particularly when the trees are in full bearing. Too many spurs should not be allowed to remain, and spacing them about 4in. apart is advisable.

Alternate-bearing trees. — From Dunn's, Statesman, and several other varieties of apple tree it is difficult

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to obtain full crops each year because spurs bearing fruit seldom produce a fully-developed fruit-bud in the same season. It is desirable, however, that a moderate crop be produced each season rather than a heavy crop one year and nothing the next. Though it is not possible to overcome completely the alternate-bearing habit of these varieties, the following methods are of assistance:—

1. Maintain a state of vigour slightly in excess of the normal for a full-bearing tree (with most varieties of this type the weaker the tree the greater the tendency to alternate cropping).
2. For the first year practise a system of deblossoming alternate laterals or the whole of the flowers from alternate leaders. The latter proved effective in a trial undertaken with Statesman trees.

Long pruning was discussed earlier in connection with the pruning of young trees. It can be repeated that some kinds of fruit and some varieties respond well to long pruning—the leaving of the leaders uncut for at least one year. Success depends on whether a variety will throw out laterals freely if the leaders are left uncut. Gravenstein and Cox's Orange Pippin respond very well in this respect, but Dougherty and Granny Smith are not so good. Obtaining sturdy leaders capable of standing up under the weight of a heavy crop is also involved. The nature of the land and the vigour of the annual growth are factors which influence results.

Weak, declining branch of plum requiring hard cutting back.

Types of Winter Nelis fruiting wood: On left undesirable, on right good type.

Generally moderate pruning is recommended except under special conditions. If the leaders are left too long, heavy laterals (the most desirable type) are developed only at the top portion of the two-year-old growth, and the lower region of the tree is devoid of them.

Pears

The bearing habit of pear trees is generally similar to that of most varieties of apples—on spurs which thrive for a number of years. Pruning with a normal full-bearing tree consists of singling out the annual leader growth and reducing it by half to two-thirds of its length, or, if the tree is becoming too high for economical working, heading back the leader to a suitably-placed lateral. The aim in dealing with the laterals is to obtain a balance between the older fruit-spurs and young wood on which to grow new fruit-spurs to replace those declining in vigour. Often these laterals show signs of making a growth further in toward the leader—sometimes at the apex of a bent-over lateral—and the cut is made back to this shoot.

Josephine pears are tip-bearers somewhat similar to Irish Peach apples, so light laterals of this variety should be left unpruned, when they will produce fruit at the apex.

Winter Nelis pear trees frequently produce a great multiplicity of fruit-spurs which are weak and, though blossoming, do not set fruit. Trees in this condition require a drastic thinning-out, in some cases almost to the skeleton stage. This will result in the fruit-spurs retained setting a good crop of fruit.

Renovating Stagnant Trees

It is often possible to resuscitate trees which have become stagnant in growth—through over-bearing, age, or lack of nourishment—by very hard pruning, either reducing the height of all leaders by several feet, or in trees which have an excessive number of leaders removing every other one. In either case it is essential that the saw cuts be properly treated as a protection against the entry of silver blight and wood-rotting fungi. The wound should be trimmed and a bitumen-product wound-dressing applied to form a complete seal, which should be maintained continuously until callusing-over is complete.

Conclusion

Pruning should be carried out regularly each year. It is one of the main factors in maintaining health and vigour in fruit trees, but cultivation, manuring, and disease control by spraying also play an important part in the growth of trees.

Photographs by Green and Hahn.

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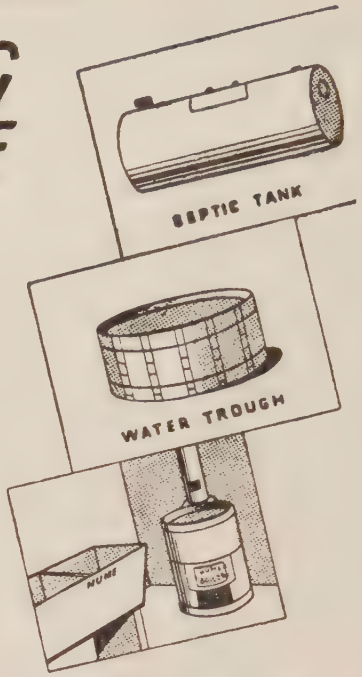

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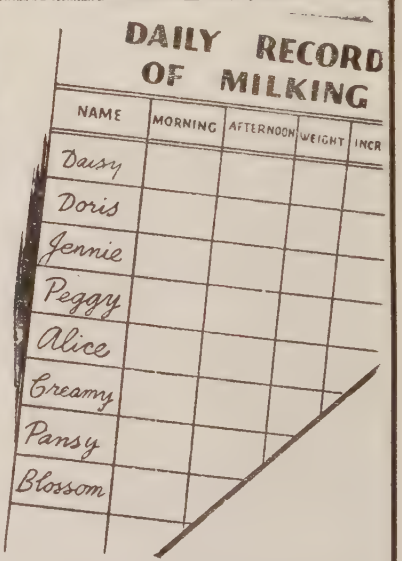

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USE OF WIND FOR POWER

A FARMER in the Koromatua district, Mr. G. Pulman, still considers wind power more economical than electric power for some jobs. He has erected a simple type of mill to drive his firewood saw, corn grinder, and tool-sharpening gear. The main driving cogs and gearing were salvaged from an old horse-powered chaff cutter that was discarded in the district nearly 40 years ago.

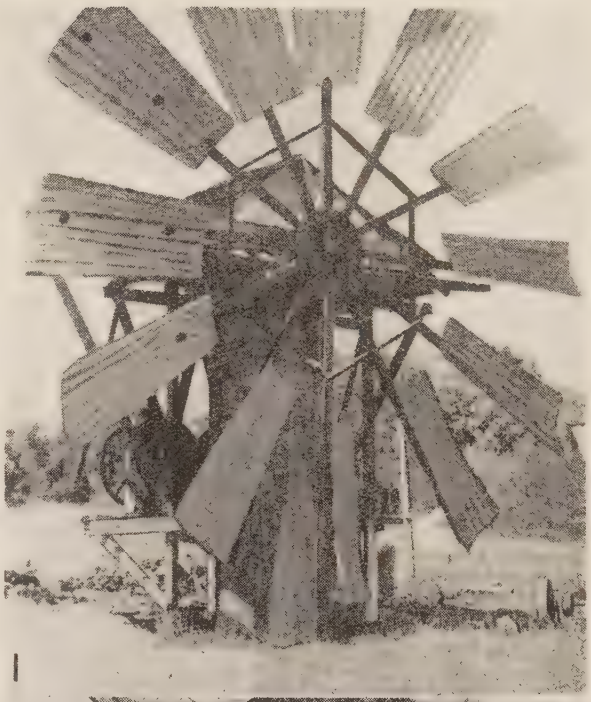
The mill sails and gearing are supported on a reinforced concrete column 3ft. in diameter, sunk 3ft. deep in hard clay soil and standing about 7ft. high above ground level. The fans are made from pieces of old corrugated roofing iron, and fastened to wooden arms 6ft. long. These arms are fastened and braced as shown in Fig. 1. The whole set of 12 arms and fans is very well balanced and functions readily and smoothly in the slightest wind. A fair amount of wind is required to drive the firewood saw, but very little is necessary to turn the little corn-grinding mill.

The usual procedure in corn grinding is to fill the grain hopper of the machine, turn the mill into the wind, and then leave it for some time, and later on go back and draw off the ground meal and refill the hopper with grain. Barley, wheat, and maize are ground for pig feeding, and the farmer makes a special feature of growing and grinding his own porridge meal; small quantities are ground at a time, so as to have it always fresh.

Fig. 2 shows the method of assembling the machinery. The main driving cog of a horse-driven chaff cutter has been turned upside down and fastened rigidly on top of the reinforced concrete column. The centre pin of the big cog thus becomes the king pin on which the whole of the machinery pivots, and enables the firewood saw in centre, tool grinder on left, and corn grinder on right (all mounted on one bench) to be turned to any position around the column, so that the sails can catch wind from any quarter. The whole outfit is then retained in position by a locking device which connects with a tooth of the main stationary cog wheel on the top of the column. Pulleys and belts connect with driving spindles of the three machines, and all gearing and machines are protected from rain by a corrugated iron roof.

Fig. 3 shows the diameter of logs the saw is capable of cutting.

—*T. E. RODDA, Fields Instructor, Hamilton.*



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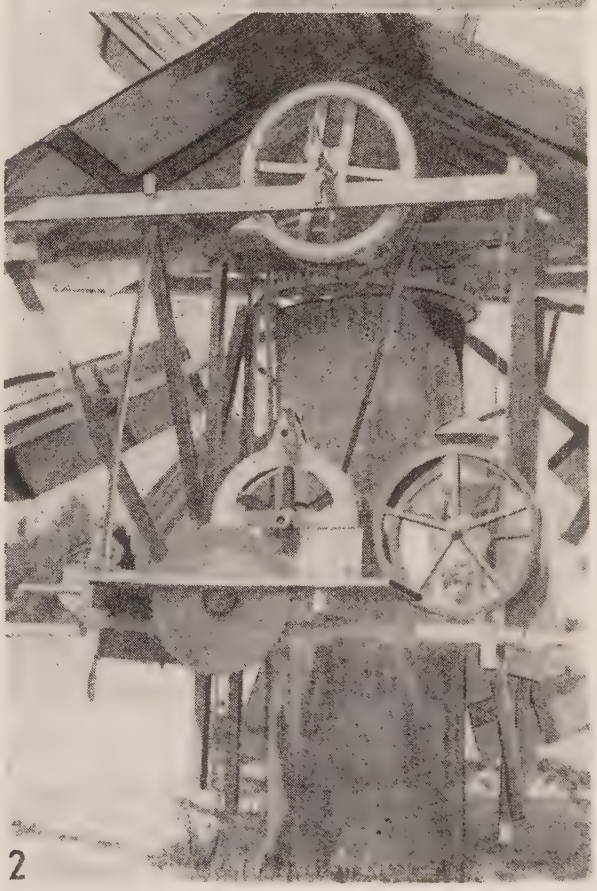

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[*Sparrow Industrial Pictures photo.*

THE WISE PLOUGHMAN

GOOD PLOUGHING IS THE FOUNDATION OF A GOOD SEED-BED, AND, WHILE BAD PLOUGHING MAY BE DISGUISED ON THE SURFACE TO SATISFY THE CASUAL OBSERVER, IT IS NOT POSSIBLE TO FOOL THE PLANT IN THIS MANNER.

★ It is folly to plough the land, particularly heavy soil, when conditions are unfavourable as a result of wet weather, or to bring up too much subsoil to the surface by unusually deep ploughing.

★ It is the wise cultivator who can judge correctly the time to plough, the way to plough, and finally the cultivation necessary for a good seed-bed.

★ In these days of mechanisation early ploughing is still necessary for tilth production, so that Nature can provide assistance with sunshine, rain, wind, and winter frost.

★ High-power and fast-moving machinery can speed up cultivation, but the old essentials of efficient soil tillage still remain. Early ploughing is desirable for obtaining a good, mellow seed-bed and better consolidation of the subsurface for sowing next spring.

FARM WORK FOR JULY

By the Fields Division

PASTURES

Preparation for Spring-sown Pasture.—The ground for spring sowing of pastures should be ploughed this month. Areas at present in crops which it is intended to sow in pasture in the spring should be ploughed as soon as the crops are removed. Arrangements should be made for the purchase and delivery of seed so that it may be tested in advance for germination and purity.

* * *

Pasture Management on Dairy Farms.—The growth of pastures will now be at its lowest ebb, and almost all of the autumn growth will have disappeared. Fields which carried this growth should be shut up after grazing for production of more growth for later feeding. As the ground becomes more moist a constant watch needs to be kept to prevent pugging.

* * *

Grass-grub Infested Pastures.—Grassland damage by grass-grub should be repaired by feeding hay heavily on such areas. There is little fear of damage being caused through pugging by this practice, because ground badly infested by grass-grub is invariably well drained and light in texture. The trampling of the ground limits the activity of the grass-grubs and the seed from the hay repairs the pasture.

HAY AND SILAGE

In those districts fortunate enough to have ample supplies of hay and silage cows should be fed these fodders to appetite. During this and next month the feeding must be heavy because grass growth is at a standstill and the animals have to be kept warm and in a fit condition by ample supplies of fodder. In certain districts these fodders unfortunately have to be rationed and fed not according to the needs but according to the means.

LUCERNE

The considerable amount of roughage that often grows on lucerne stands should now be fed off quickly by putting in a large number of stock for a short period. If oats have been sown on the stand in the autumn, the animals will receive extra grazing from the growth of these, or the growth may be cut and fed to stock, the latter, if practicable, being the better practice. When the animals have been removed the stand will be in a fit condition to commence early growth.

CEREAL GREENFEEDS

As soon as the ewes lamb they should be placed with their progeny on greenfeed so that the milk supply of the lambs is maintained. Greenfeed for milking cows should be grazed, or cut and fed out if it is too long and grazing would result in waste through trampling. If in short supply, it should be rationed to the cows.

ROOT CROPS AND CRUCIFEROUS CROPS

The feeding of swedes and chou moellier will be well advanced on most farms, and with grass growth at a standstill farmers will be fortunate who have remnants of these crops for feeding during the present time. At this time of the year carrots and mangolds are a great standby, and farmers will find that the feed from these crops is extremely useful at a period such as this when the grass growth has almost ceased. Mangolds will not be ready for feeding until 4 to 6 weeks after pulling.

Plough ground as soon as it becomes vacant through feeding off the crops in preparation for spring-sown crops or pasture. Grassland should be deep ploughed this month for sowing rape and root crops in the spring. Before ploughing, the shells of swede and turnip crops may be grubbed out for a final cleaning up by ewes.

POTATOES

Deep plough in preparation for main crop potatoes. Examine potato pits and see that they are not letting in rain and are frost proof, and to see how the potatoes are keeping; if not keeping well, dispose of them.

CEREALS AND PEAS FOR GRAIN AND CHAFF

Forward cereal crops should be fed off lightly.

STOCK

Sheep.—In the early districts lambing will have commenced and special provision should be made for feeding ewes with early lambs, particularly those with twins. See that material is available for tailing; pens should be located out in the fields and away from dust and dirty yards.

* * *

Cattle.—Calves should receive their mother's milk when born. As soon as the young calves have been a period on new milk they should be gradually changed from that to skimmilk. Cows, as soon as they come into profit, should be placed on good feed.

Pigs.—Sows with litters should be fed separated milk that is available, leaving the stores to consume coarser fodders such as roots and pasture. A little meat meal should be fed with such fodders.

GENERAL

Now that the new milking season is commencing, consideration should be given to better means of conservation of cowshed liquid manure. The cleaning of drains should be finished by now. Continue to cut hedges, repair fences, and carry out implement and building repairs.

Changes in Method of Paying Wages Tax

TWO changes affecting payment of wages tax are of importance to all employers.

First, from May 13 the rate of wages tax is reduced from 2s. 6d. in the pound to 2s.

Secondly, from May 1 wages-tax payments of £2 or more may not be denoted by social security stamps, but must be paid in cash or by cheque and an official receipt obtained.

For such payments employers must complete Form S.S.C. 169 ("Certificate of wages etc. paid and of Social Security Charge and National Security Tax deducted"). Signed by the employer, his agent, or a responsible employee, it should be presented at a money-order post office or branch office of the Land and Income Tax Department when payment is made. Only one form should be used for all employees.

For payments of less than £2 social security stamps may still be used.

Under both methods it is required that payment of the tax be made within three days of deduction from the wages.

Wages tax must be paid by all persons 16 years of age or over. Not only salaries and wages, but such payments as bonuses, directors' fees, commissions, value of lodgings, keep or meals supplied, free quarters, or other benefits in kind, are subject to the tax.

Wages records should be retained by employers and be available for inspection for a period up to 5 years.

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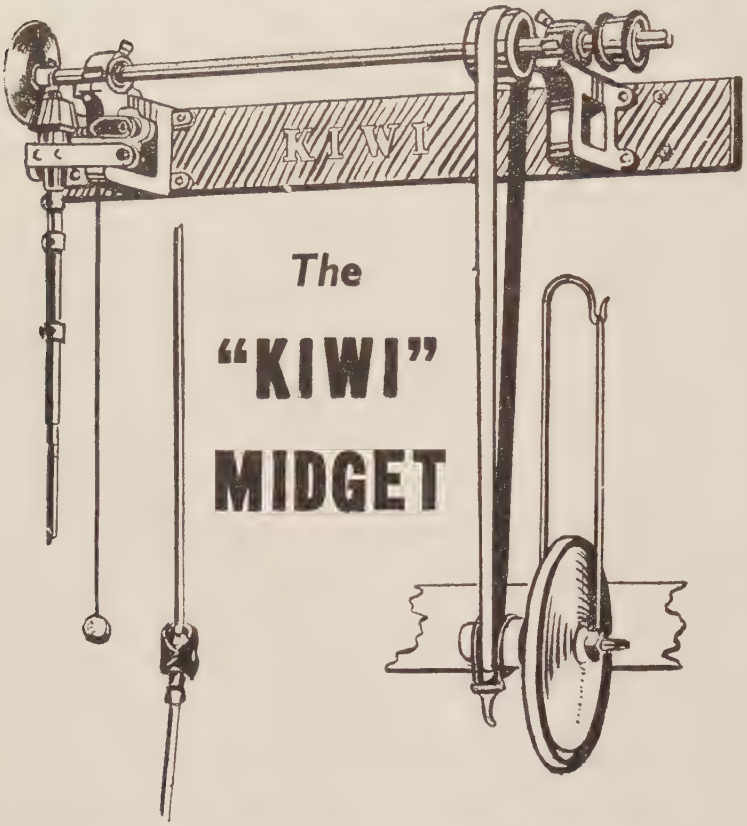

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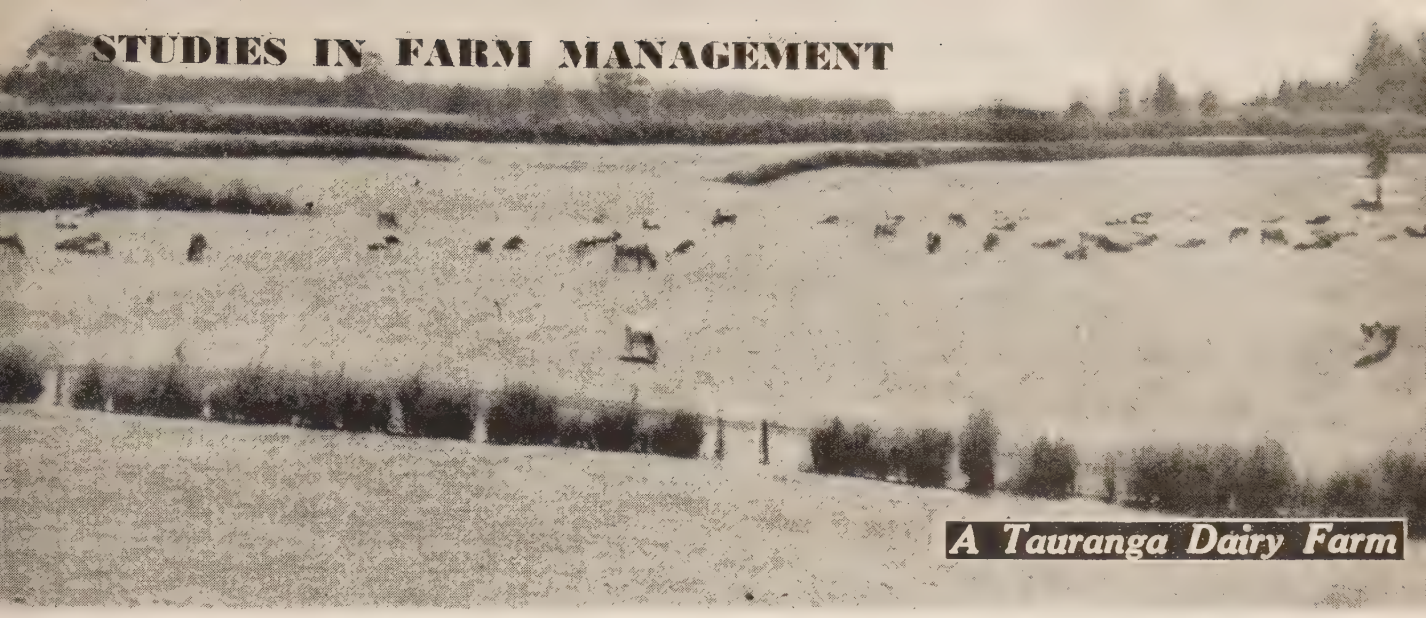
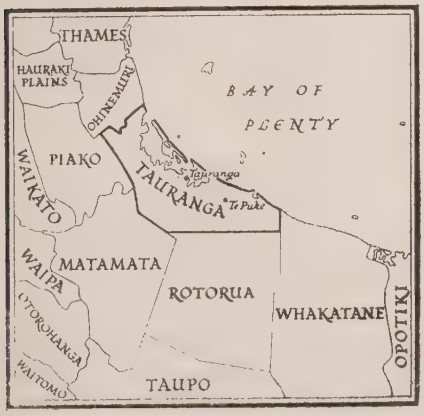


A Tauranga Dairy Farm

FEW districts in New Zealand have been so richly blessed by Nature as has Tauranga County. Not only is it one of the foremost dairying districts in Auckland Province, but as a scenic and holiday resort it is known throughout the country. Coincident with the development of rail and road access during the past 20 years, there has been a phenomenal increase in the productivity of the area. Considering the scope of easy country still awaiting development, it is not being over-optimistic to say that there should be a further considerable improvement in the future.

By **A. V. ALLO,** *Instructor in Agriculture, Tauranga.*

TAURANGA County, on the sea-coast of the western Bay of Plenty, is roughly 80 miles long, with a width varying from 8 to 20 miles. It stretches from the Athenree Gorge in the north to the Otamarakau Valley in the south, and inland the county boundary is the Kaimai Hills. For the most part the area is undulating to hilly, with gently-rolling country near the coast rising inland to a series of low hills. Round the Te Puke district, in the Papamoa, Te Tumu, and Maketu areas, are large blocks of drained or partly-drained silty-peat swamp country. Going inland in the Tauranga and Te Puke districts the country becomes rather abruptly broken by a series of deep gorges, running in general north and south in the Tauranga area and east and west in the Te Puke district. These gorges, 100 to 200ft. deep and about 200 yards wide, are characteristic features of the landscape. On such country farming is carried out on the flat plateaux between the gorges. Though most of the coastal country is under occupation and has been more or less developed, much of the hinterland is covered with fern and scrub and large areas of bush are found further inland.



One of the beauty spots of New Zealand is Tauranga Harbour, with Mt. Maunganui standing sentinel to the north-east. Many sportsmen throughout the Southern Hemisphere will recall with keen appreciation the splendid fishing of all types in these waters, from the big-game fishing at Mayor Island to hand-line fishing nearer the coast. There are two fairly large rivers in the county, the Wairoa, with its headwaters in the Kaimai and entering the harbour in the Te Puna district, and the Kaituna in the Te Puke district, rising at Lake Rotoiti and winding down to the sea at Maketu. There are many smaller streams arising in the hills and emptying into the sea.

Rail access to the district is good, with the main line to Taneatua running throughout its length. There is a first-class main highway to Tauranga from the Waikato, running over the Kaimai and providing one of the finest scenic drives in the province. Another main road passes from Rotorua to connect with the main Tauranga-Whakatane highway, and from the north entry is from the Hauraki Plains via Paeroa and Waihi.

The borough of Tauranga, centrally situated on the shores of Tauranga Harbour, is the administrative centre of the county. On the opposite side of the harbour, Mt. Maunganui is a popular holiday resort. Eighteen miles east of Tauranga is the flourishing borough of Te Puke, and 25 miles to the north is the township of Katikati. With a series of country stores outside these four main centres, settlers have reasonably good sources of supplies. Nearly all of the county is served by electricity and by rural mail delivery.

There are three dairy factories in the area, at Katikati, Tauranga, and Te Puke, all making butter, with a total output in the vicinity of 7,000 tons.

With an area of 614 square miles occupied by a total European and Maori population of rather less than 16,000 in 1941, it is evident that there is ample room for further settlement. This applies particularly to those who have the capital and energy to settle much of the relatively-easy country still awaiting development.

Types of Farming

Tauranga County is predominantly a dairying district, with more than 1,100 dairy holdings and 51,800 cows in milk. With conditions so well suited to dairying this is only to be expected, though other types of farming must also be considered in any survey of the productivity of the district. During the past few years the number of sheep farms has increased

with fat-lamb production the main activity; 151,000 sheep were shorn and 114,000 lambs tailed in the 1943-44 season. Along the coastal areas, particularly near Tauranga, are some of the finest citrus orchards in New Zealand, the county producing about half of the Dominion lemon crop. During the war market gardening was developed on a large scale in the Katikati district, with very good results.

Climate

The average rainfall in the Tauranga district is about 40in. yearly, the hill country in general receiving more rain than the coastal areas. Rainfall is reasonably well distributed throughout the year, though a dry period in the late summer is by no means uncommon.

The district is relatively free from extremes of heat and cold. High hills inland give shelter from very cold winds, and the warm, northerly, rain-bearing winds have unrestricted entry. Though frosts are experienced in most parts every winter, they are relatively light compared with those elsewhere in New Zealand; a few coastal areas are completely frost free.

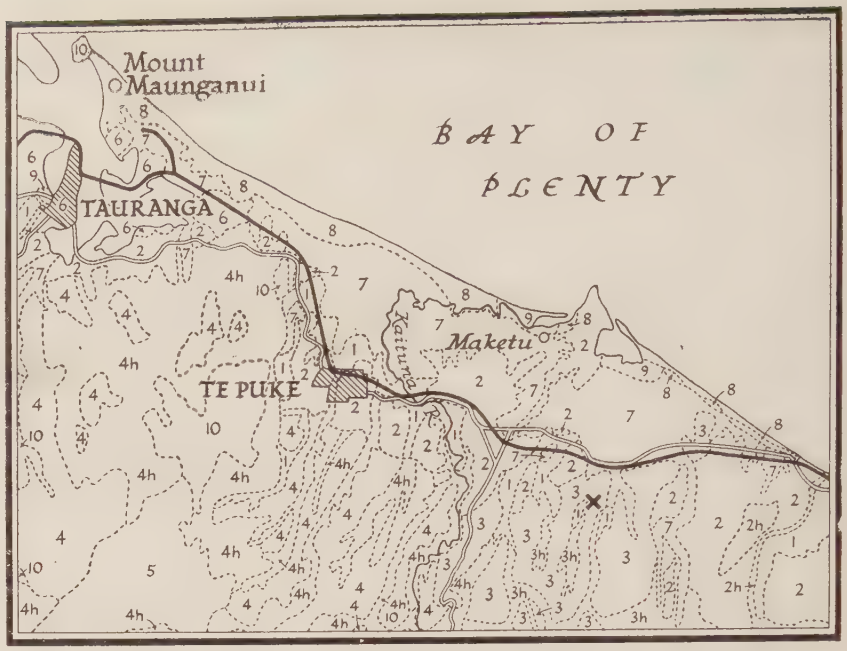
It is thus evident that Tauranga County is exceptionally well favoured climatically, and this factor is partly responsible for the really remarkable influx of new settlers during the past decade.

Soil Types

The main soil type is mostly a medium to light pumice loam, deposited in the Kakaroa ash shower. Most of the soil, with the exception of the swamp areas, is of this pumice origin, and there are no marked changes of soil type in contiguous areas. The swamps are of a silty-peat formation, and in some places are sinking steadily; fresh stumps keep coming to the surface, presenting a problem to settlers on those areas.

In its natural state the pumice soil is of a low fertility, but responds quickly to phosphatic topdressing and, with proper treatment, is capable of carrying a first-class pasture. It is easy to work, with a good natural drainage provided by the porous subsoil. It does not become sticky in wet weather, and even after heavy rain can be worked in only a few hours.

On the narrow isthmus that projects into the harbour, and ends in Mt. Maunganui, the soil is a very light sandy loam, merging into a belt of low sand hills on the coast. Natural fertility is very low, but several areas have been developed by enterprising settlers, who have obtained good results. One of the chief drawbacks of this soil type is the way in which it dries out in dry weather. By ploughing in green crops and thus raising the humus content of the soil, combined with judicious stocking, the moisture-holding capacity of the soil can be greatly improved. Overstocking of this class of country is fatal.



Legend

Opiki sandy loam on peat	1	Kaharoa medium sand	5
Paengaroa medium sand	2	Katikati sandy loam	6
" hilly phase	2h	Peaty soils	7
Paengaroa gravelly sand	3	Sands and peaty soils	8
" hilly phase	3h	Saline soils	9
Oropi medium sand	4	Skeletal soils	10
" hilly phase	4h	Location of farm	×

Pasture Establishment

Provided always that a few fundamental conditions are observed, it is easy to establish pasture on the pumice loams. One of the most important factors is adequate consolidation. In its natural state the pumice soil is of a loose texture, and it is difficult to work it down to a firm seed-bed.

When possible, the land should be ploughed with a long-mouldboard plough to a depth of 4 or 5in., ploughing being done early to allow of thorough aeration. After ploughing every operation should aim at a fine, consolidated seed-bed, to attain which it is a very sound practice to follow the ploughing with a rolling on the furrow. This is a most valuable operation, helping to fill in the air pockets at the bottom of the furrow and giving that deep consolidation that is so difficult to obtain on light country. After the rolling two double cuts with the discs are usually required, followed by two or three strokes of the tine harrows and a final rolling before sowing the seed. The seed should be covered with a light harrowing and the ground rolled.

One of the secrets of success in this country is to allow ample time to do the cultivation thoroughly. Hurried working by slapdash methods will not produce results on this type of soil, and many costly failures could have been avoided had time been allowed to do the work properly.

The introduction of Certified pasture seeds has been of great value to the farmer in the Bay of Plenty. On this light country most farmers aim at getting a good pasture established and keeping it down for the longest possible time. Little or no short-rotation grassland farming is done in the district. Before the advent of Certified seeds pasture establishment was very chancy, and there were many failures as a result of poor-quality seed being sown. Since Certified seeds became available there has been a great improvement in the quality of pastures, and today very few farmers will sow anything but Certified seeds.

The ultimate aim on most of the pumice country of Tauranga County is a perennial ryegrass-white clover-paspalum association, with species such as cocksfoot, red clover, and crested dogstail taking a secondary place in the sward. In addition, special-purpose grasses such as prairie grass have been established in selected paddocks on a few farms, with really good results.

In any seed mixture recommended for the Tauranga district Certified perennial ryegrass should take pride of place, as it provides the bulk of the early feed. As production from the ryegrass begins to drop its place is taken by cocksfoot, closely followed by paspalum. By correct pasture management and grazing control it is possible to spread grassland production over the milking season, and thus avoid any marked slumps.

Timothy is a grass that does very well in the district, particularly on the heavier country. Its great palatability results in its being difficult to detect in a grazed pasture because of its having been eaten down hard, but it is surprising how much will show up in a late crop of hay. Crested dogstail, though a low producer compared with ryegrass, is worthy of inclusion in the pasture mixture, as it is a valuable bottom grass, capable of growing in places where the fertility is too low for maximum ryegrass production.

On all soil types healthy clover development is an essential for a healthy pasture. On the pumice loam white clover stands supreme. It grows and produces well throughout the county, and should not be omitted from the pasture mixture. Red clover, too, plays an important part in pasture production, and was of marked value in the early stages of development of the district. Considerable areas of new country were brought in by sowing down a temporary pasture dominantly red clover, or swedes and red clover, such areas being ploughed and sown down in permanent pasture after a year or two.

Though it is not possible to give a pasture mixture to suit every farm in the county, the following mixture is a guide on which the farmer can base his sowing, and it can be modified to suit local conditions and the requirements of the farmer:—

	lb.
Certified perennial ryegrass	20
Certified cocksfoot	6
Certified white clover	2
Red clover	3
Crested dogstail	2
Timothy	1
Paspalum (if required)	6
	40lb.

Best results are generally obtained when new grass is sown down before the early autumn rains. Spring-sown pastures are usually much troubled by weed growth, and because of this are not commonly favoured. It is unwise to leave the sowing too late in the autumn, as time should be given for the new pasture to become thoroughly established before the cold weather comes.

Management of Pastures

Methods of pasture management vary greatly in the county. Many farms are well subdivided into small paddocks and rotational grazing is practised with good results. On others there are very big paddocks and little attempt to control the grazing of the stock. Here pasture control is very difficult, and it is on this type of farm that the paspalum often gets away in the autumn. One of the most important developments in the farming methods of the district when conditions return to normal will undoubtedly be the subdivision of many farms into paddocks of a more manageable size.

Probably the biggest single problem in pasture management is the control of the paspalum growth in summer. Though topping is practised to a greater extent than ever before, there are still far too many farms on which this grass is allowed to get away rank with inimical results both to the finer grasses and clovers and to the stock which have to graze on such "standing hay." This practice is bad from every angle, and many good swards have been spoiled by its continuation for years.

Harrowing is fairly regular throughout the district. The usual procedure is to harrow the pastures with a heavy set of chain and tripods in the early spring after feeding out, and later harrowing is usually confined to a stroke with a light set of chains to spread the droppings. Heavy sets of penetrating harrows are not commonly used, as many farmers fear the incidence of weeds after a pasture is opened up. An exception is when a heavy sole of paspalum may receive a heavy harrowing with beneficial results, particularly on the heavier country.

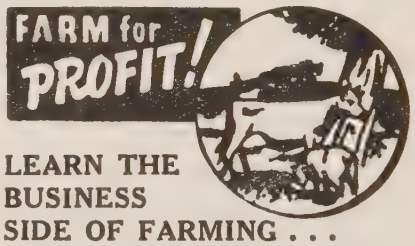
The saving of winter grass is one practice that could be improved. Though paddocks are shut up for early feed on many farms, there are still too many farmers who allow their stock access to all paddocks during the winter, with a consequent shortage of feed when the cows come in. Even where paddocks are closed, it is often done far too late, preventing the ryegrass making much growth before the winter sets in.

Considerable success has been attained by oversowing indifferent pastures with perennial ryegrass and white clover. Where a pasture has too heavy a sward of paspalum, with too little of the finer grasses, or where a sward is inclined to be weak, this practice has given excellent results. The paddocks are grazed clean in early March and surface worked with discs or heavy harrows. A good sowing to apply is 12 to 15lb. of Certified perennial ryegrass, 2lb. white clover, and 2lb. crested dogstail an acre. The paddock should then be topdressed, lightly harrowed and rolled, and treated as a paddock of new grass. A surprising improvement will result. A common mistake is to graze areas treated in this fashion too early, giving the ryegrass a severe setback.

In common with most other areas in New Zealand, the soils of Tauranga County are deficient in phosphates, and regular dressings of phosphatic fertilisers are required when they are again obtainable readily. In parts of the hill country in the Katikati district there has been a potash response in some of the pasture topdressing trials carried out by the Fields Division, but further work is needed to define such potash-responsive areas. Though no striking responses have been obtained from the use of lime, liming is commonly carried out in the district, farmers claiming that their stock keep healthier and do better on limed pastures.

Hay and Silage

The conservation of surplus pasture growth into hay and silage is a fairly strong feature of Tauranga farming. In the 1943-44 season nearly 16,000 acres of pasture were cut for hay and nearly 3,000 acres for silage. In addition there were more than 1,300 acres of lucerne, which would average at least three to four cuts a year. Even so the winter feed supply on many farms could be bettered, and



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much of the paspalum growth at present allowed to get away rank and be wasted could be saved for hay or silage. The quality of the hay cut is generally fair, but much of the silage is cut too late and is overcooked.

Cropping

In the early days of farming in Tauranga County maize was a very important cash crop, and to a large extent receipts from it paid for the grassing of many farms. With the introduction of topdressing, Certified pasture seeds, and the change to dairy production and straight-out grassland farming, the area of maize grown declined until now only about 800 acres are grown each year for grain. On most farms maize is grown only for domestic requirements, little being available for sale. The major exception to this is a considerable area grown each year under the supervision of the Native Department on Matakana Island in Tauranga Harbour. The bulk of this maize is grown for sale.

The area of maize on the average dairy farm is between one and three acres, and it is nearly always put in a paddock ploughed out of old pasture. Ploughing is usually carried out in early September and the ground worked down with discs and harrows to be ready for sowing by the third week in October. As with all other crops, the yield to a large extent depends on the thoroughness with which the ground is worked, and many light crops have followed hurried and careless working.

The most popular variety of maize grown in Tauranga County is the Large Yellow Dent. Motiti and, to a far less extent, Early Butler are grown on inland areas. The usual rate of seeding is 12 to 15lb. an acre, the seed being sown in rows 36in. apart, with 15 to 20in. between plants. Most areas are planted by hand or with a dibbler, though on some farms a maize planter is used. In normal times the crop is usually sown with a mixture of superphosphate and blood and bone at the rate of 3cwt. an acre.

It is usual to include a pound or two of kumikumi seed with the maize to increase the total productivity of the area.

When the crop is through the ground it should be kept well scarified until it is too tall to be worked. The farmer who keeps this crop well cultivated and free of weeds reaps the benefit in a better crop.

Harvesting is usually carried out in May, the work often being done on contract by gangs of Maori pickers The maize is stored in the crib for about six weeks to mature before it is shelled as required.

Probably the most important crop in the Bay of Plenty is lucerne. At present there are more than 1,300 acres in this most valuable of crops, and the area is increasing yearly. Conditions are ideal for the growing of lucerne, which will afford three or four cuts a year under good management.

Small areas of turnips, green maize, or millet are commonly sown for autumn supplementary feed, and carrots, chou moellier, or swedes are often sown for winter feed for cattle and pigs. Many farmers have adopted the practice of sowing a few acres of oats or barley in the autumn to provide greenfeed for the early calvers. Such areas are usually closed after being grazed off and a cut of hay or silage taken from them.

In the warmer coastal parts small areas of potatoes, averaging about an acre, may be planted in August or September, and large areas of cabbages and carrots were grown at Katikati under contract to the Internal Marketing Division for the armed forces in the Pacific.

Cattle

Jerseys are by far the most popular breed of dairy stock in the district, which has some very fine pedigree animals. Most of the herds are of good grade Jerseys, though many contain a dash of Ayrshire, Friesian, or Shorthorn blood. Few, if any, farmers do not use a good pedigree bull, and the quality of the dairy stock is steadily improving. There are several good herds of Ayrshires and Friesians, both of which breeds do well in the district. Where beef cattle are run

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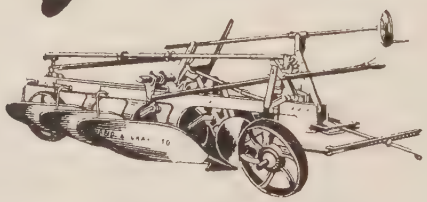

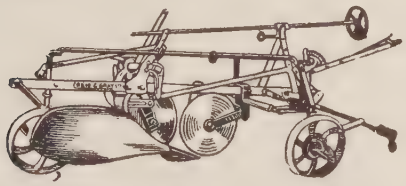

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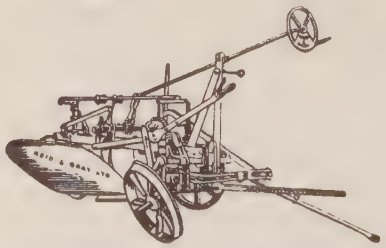

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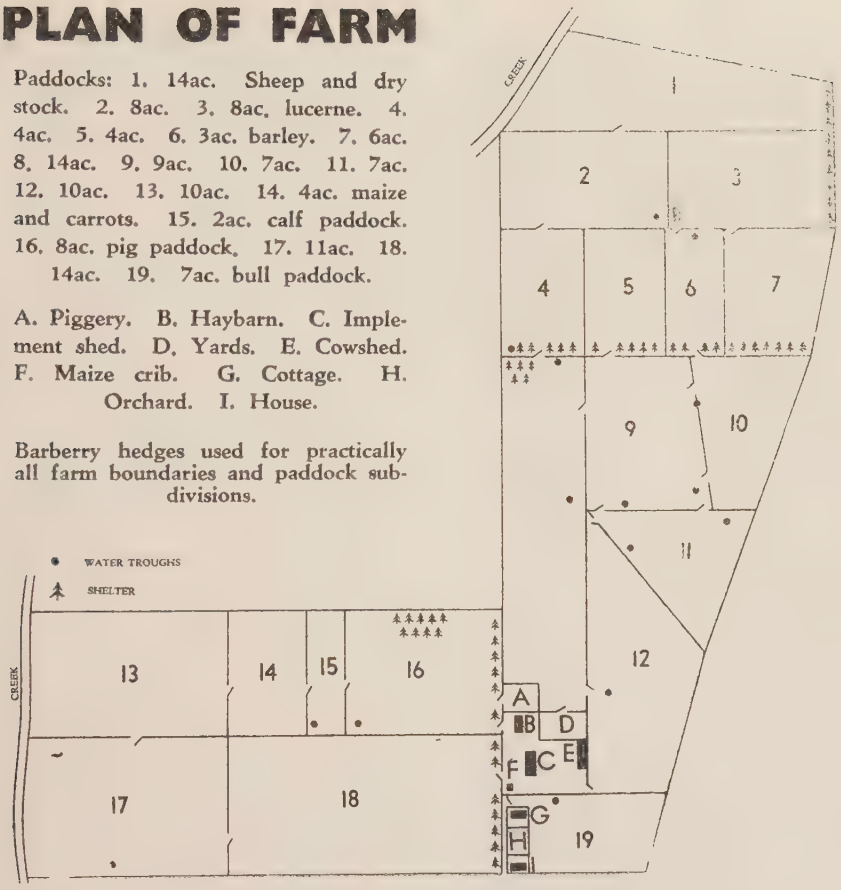
PLAN OF FARM

Paddocks: 1. 14ac. Sheep and dry stock. 2. 8ac. 3. 8ac, lucerne. 4. 4ac. 5. 4ac. 6. 3ac. barley. 7. 6ac. 8. 14ac. 9. 9ac. 10. 7ac. 11. 7ac. 12. 10ac. 13. 10ac. 14. 4ac. maize and carrots. 15. 2ac. calf paddock. 16. 8ac. pig paddock. 17. 11ac. 18. 14ac. 19. 7ac. bull paddock.

A. Piggery. B. Haybarn. C. Implement shed. D. Yards. E. Cowshed. F. Maize crib. G. Cottage. H. Orchard. I. House.

Barberry hedges used for practically all farm boundaries and paddock subdivisions.



on the sheep country Herefords predominate, though Black Polls and Black Poll-Hereford cross are common.

Sheep

A number of farmers have recently changed from dairying to sheep production for the fat-lamb trade, and aged sheep may be found on many farms to keep ragwort under control. Ragwort is the most serious weed in the county, particularly on the higher country, and in some cases has forced a farmer to change from dairying to sheep farming. In other cases sheep are run in conjunction with the dairy herd in an endeavour to keep the worst of the ragwort under control.

Crossbred sheep are by far the commonest in the district, and are usually bought from the east coast. Every autumn large mobs of sheep from the Gisborne district are driven through to the sheep sales at Te Puke and Tauranga and bought by the Bay of Plenty sheep farmer. One or two crops of lambs are taken from them before they are fattened and sent to the works. The Southdown is the ram most often used, though the Romney is in favour in some areas. In nearly all cases the lambs are fattened on the mothers, and very few lamb-fattening crops have to be grown.

Pigs

The production of pig meats is a most important sideline of the Tauranga dairy farmer. As may be expected in a district supplying butter factories, the main pig food is skim-milk, supplemented with meals or grain. On most farms there is a small area in crop for winter pig feed, the main crops being swedes, artichokes, carrots, maize, kumikumi, and sugar beet.

The most popular breeds of pigs in the district are Berkshire, Tamworth, Large Black, and Large White, with various crosses between these types. There are several good pedigree studs.

Many farmers are now carrying their autumn litters as stores during the winter, feeding them on home-grown crops, bought meals, and what little skim-milk is available, and are finding these special pig crops very profitable. It is now generally recognised in this district that pigs do very well if given good pasture grazing, and most farmers have a good area of grass available for their pigs.

During the past few years there has been a great improvement in the housing of the pigs, and there are now many good lay-outs, quite a number of which have been constructed under the supervision of the District Pig Council. Great interest has been shown in the use of sawdust concrete for flooring and roofing pig houses, and several farmers claim successful results from the use of this material.

Statistical Data, Tauranga County, 1943-44.

Total occupied area	282,292 acres
Area under cultivation	168,541 acres
Area in pasture	152,311 acres
Area cut for hay and silage	19,798 acres
Area under annual crops	3,247 acres
Number of dairy cows in milk	51,841
Number of other cattle	42,731
Number of sheep shorn	151,407
Number of pigs	23,682
Number of holdings	1,428
Average area of holding	198 acres

The main products of Tauranga County are butter, pigs, fat cattle, wool, fat lambs, citrus and stone fruits, small fruits, and timber. Progress has been remarkable during the past 20 years, and the district has prospects of becoming one of the most prosperous and productive areas in the country.

A PONGAKAWA DAIRY FARM

A typical dairy farm, which has been under its present ownership for a considerable period, is 150 acres in area, situated in the Pongakawa district about 12 miles from Te Puke borough. The present owner took over the property in partnership with two brothers in July, 1914, when it was part of an area of 219 acres. At that time 30 acres were in manuka and fern, the balance being in pasture of a kind, mainly trefoil and fog, with a trace of cocksfoot; the finer grasses and clovers were almost completely absent from the sward. The poor quality of the pastures is best shown by the carrying capacity at that time, which was 39 cows and 27 head of other stock. Even with that light stocking it was a constant struggle to find enough feed to keep the stock going. All the paddocks were very large, with fences in a poor state of repair and no internal shelter. The absence of water troughs added to the difficulties of managing the area.

The soil is a medium to light pumice loam, with a free subsoil, and the country is undulating, with low valleys providing good shelter for the stock in all weathers. There are also about 10 acres of good alluvial drained swamp, a good standby in a dry summer. Ample first-class water is available from a spring on the swamp.

Because of an almost complete lack of capital, progress in developing this property was slow at first. In fact, it was necessary for one brother to spend most of his time in outside contracting to earn enough ready cash to keep things going. However, by adopting a policy of putting everything back on the farm above bare living expenses, the partners found they were able to make headway.

The first tasks tackled were to cut up the paddocks into a more manageable size and to repair existing fences.

VIEWS OF THE FARM

Upper—The well-planned modern homestead has an attractive setting among trees and shrubs. Middle—The splendid shelter is a feature of the farm. There is a glimpse of the maize crop between the trees. Lower—Another view of the farm with homestead and farm buildings in the background.

Water was laid on to all paddocks, and later on barberry was planted along most of the internal fence lines, so that today the farm presents a pleasing appearance with its neatly-trimmed hedges and shelter plantations of gums, pines, macrocarpas, and lawsonianas.

After five years one of the brothers left the farm to take over a property on his own, and the remaining two stayed in partnership until 1936, when they divided the farm, taking half each. The area at present under discussion is 109 acres freehold and 41 acres held under a long-term lease.

Today there are 17 paddocks on the farm, varying in size from 4 to 14 acres. The farmer appreciates that some of the paddocks are still too large for efficient pasture management, and he has set himself the aim of having all his paddocks between 6 and 8 acres.

The pastures are generally of very good quality, with paspalum, ryegrass, and white clover as the dominant species and a good sprinkling of cocksfoot and crested dogstail. On some of the night paddocks there is a good showing of prairie grass, and there is little doubt that this grass would be a distinct asset on the farm if used as a dominant sowing in a special paddock for winter and early spring feed. Throughout the farm the pastures are dense and vigorous, and a striking feature on an area of this size is the relative freedom from weeds. Ragwort, the most troublesome weed in the county, is kept well under control by the farmer, who finds that by treating any plants he finds with sodium chlorate he is able to prevent this weed from becoming a problem. The only other weeds present in any quantity are *Poa annua* (found in weak places in the sward and round gateways) and flatweeds of the catsear and ribgrass type.

Pasture Establishment

During the 31 years that he has been associated with this area, the farmer has gradually ploughed up all the old, low-producing pastures, and resown with a mixture of the better-class grasses and clovers. In nearly all cases one or two crops of maize or turnips were taken out of the paddock before the grass seed was sown. The grass-seed mixture used has changed with the farmer's experience, and the general mixture now used is:—

	lb.
Certified perennial ryegrass	20
Certified cocksfoot	5
Certified white clover	1½
Cowgrass	2
Italian ryegrass	5
Paspalum	6
	39½lb

One point always stressed is that Certified seed must be sown, and in no circumstances would the farmer consider sowing so-called "cheap" seed. Sowing always takes place about February and ample time is allowed to prepare a good seed-bed. Full appreciation is given to the importance of thorough cultivation, and grass seed is never sown on a hurriedly-prepared bed. Ploughing is done in the summer and the ground allowed to lie fallow until the autumn, with an occasional working to control weed growth. The aim is to obtain a fine, firm, weed-free seed-bed, and a study of some of the younger pastures clearly indicates the care taken in cultivation. About 3cwt. of superphosphate an acre is sown with the seed, and a further dressing of 3cwt. applied the following spring. It is not long before the new grass becomes well established and produces a large quantity of highly-palatable feed. In managing his new grass the farmer is careful to avoid over-stocking, and the first two grazings are usually carried out by young stock.

Pasture Management

To a large extent the great improvement in the carrying capacity of this farm has been the result of the improved management of the pastures. Rotational grazing is practised throughout the year, the cows being put on a fresh day paddock daily and a fresh night paddock every second night. During the summer the maximum of hay is cut, and little or no topping of pastures is done. This means that a certain amount of paspalum gets out of control, and it is considered that it would be of benefit to the pastures to top such rank growth. During the winter and spring the harrows are kept busy spreading droppings, and the absence of nitrogen patches in the pastures is a feature of this farm.

Before fertiliser rationing the usual topdressing was 3cwt. of superphosphate an acre, applied in the early autumn, and 4cwt. of lime in the autumn or early winter. Early topdressing of this country is important to stimulate the growth of ryegrass, which supplies the bulk of the early spring feed.

At present no use is made of liquid manure on the pastures, though the solids from the shed are spread out on the sidlings every winter. The lay-out and site of the cowshed are such that it would be easy to construct a tank to collect the shed washings, and the farmer intends installing such a tank in the near future.

Hay and Silage

The farmer appreciates fully that the way in which his herd is wintered will largely determine its production during the following season, and he

Upper—The cowshed. Middle—Capacious implement shed gives full protection for all farm implements. Lower—One of the hay barns with a capacity of 1,800 bales. Alongside is a stack of lucerne silage.

makes certain that he has adequate winter feed on hand to carry his stock through in good condition. Eight acres of lucerne yield five good cuts a year, and in addition 25 acres of meadow hay are cut. This consists mainly of ryegrass, paspalum, and white clover. The first cut from the lucerne is stacked as silage, and the later cuts are made into hay, unless the weather makes that impossible, when silage is made instead. By far the greater part of the hay saved is baled on the farm, there being two barns capable of holding 3,600 bales. Both of these barns are filled every year, and in addition there are always two stacks of hay and at least one of silage. It is thus quite obvious that on this farm winter feed supplies are adequate for the full needs of the stock.

Every year the farmer closes up 20 acres of ryegrass-dominant pasture early in April, and by spelling this area during the winter ensures that his early calvers have adequate good grass.

While the cows are dry they are fed hay and what grazing is available. In the spring they are given a ration of silage as they come in, plus a short time on the winter-saved grass, and adequate supplies of hay. The farmer appreciates the necessity of feeding out until the spring growth is well away, and continues to give hay to his cows until the end of September. The ration is one bale to five cows at night and one bale to seven cows in the daytime. If spring is late and feed is short this ration is increased.

Cropping

During the early years of its development the farm produced large areas of maize, but of recent years, with the establishment of high-producing pastures, the area in maize has been greatly reduced, until now only 3 or 4 acres are grown each year, this area yielding ample grain for the pigs on the farm.

The practice is to plough out grass early in the winter, disc and harrow in the spring, and have the paddock ready for sowing about the middle of October. Best results have been given by the Large Yellow Dent variety, which is sown at the rate of 15lb. an acre in rows a yard apart, with 18in. between the plants. A pound or two of kumikumi seed is mixed with the maize, which is sown with the planter.

The ground is harrowed about a week after sowing to kill any seedling weeds, and a second harrowing is done after the maize has been through the ground about a week. When the crop is well through gaps in the rows are filled up with kumikumi. Regular scarifying is carried out until the maize is too high to permit further working.

Harvesting takes place in May, and the crop is stored in the crib and used as required. For the first six weeks after harvest the cobs are fed whole to the pigs, but after that they are shelled and the grain is crushed. Yields vary with the season, the average being 50 to 60 bushels an acre.

Two crops of maize are usually taken off a paddock, the second being followed by a spring-sown crop of Italian ryegrass (1 bushel) and Algerian oats (2 bushels), which is cut for hay in January and the ground then worked down for grass. This year the farmer has replaced the oats and rye with a spring sowing of 2 bushels of barley an acre, which will be cut and baled for the pigs in January.

Every year an acre of carrots is grown for the pigs. The usual varieties grown are White Belgian and Guerande, the latter being preferred because it is more hardy. They are sown after grass, and no more than two successive crops are grown, as by then weeds would be too much of a problem. The ground is ploughed in the winter and worked down in the spring. Two sowings are made, the first in mid-October and the second about the first week in November.

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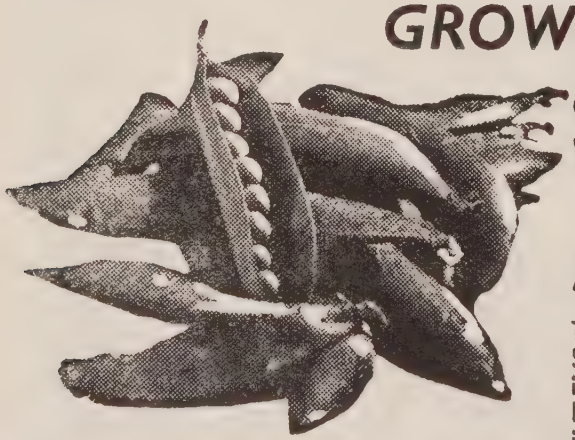

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They are sown in 18in. rows at the rate of 4lb. of seed an acre, and are fed off to the pigs in the late autumn and winter.

Finally, and most important of all, there are 8 acres of lucerne. It has long been recognised that lucerne is one of the most valuable fodder crops that can be grown in the Bay of Plenty, both as a source of high-quality hay and silage and as a succulent to be cut and fed out to the stock in times of drought.

This stand was sown down in 1939 and has given five good cuts a year since then. The paddock was very badly infested with Indian doobj and considerable work was necessary to clean the ground before the crop was sown. The method adopted was to plough in the late spring and keep working the twitch with cultivators during the hot summer months. The following autumn the ground was again ploughed and sown with 2 bushels of oats an acre. These were grazed by the cows in July and August, after which the ground was again ploughed and worked down, the lucerne being sown in November at the rate of 18lb. an acre. For many years there was a really fine stand of lucerne, possibly one of the best in the district. Today it is not as good as it was, because of an attack of *Sclerotinia trifoliorum*, and it is the farmer's intention to give the paddock a good discing next autumn and work in a sowing of prairie grass seed. Last autumn the area was oversown with 2 bushels of oats an acre, and this spring a heavy cut of oats and lucerne was harvested for silage.

All gates on the farm are wooden and well hung.

The Dairy Herd

The dairy herd of 118 Jersey-Ayrshire cross cows last year produced 29,356lb. of butterfat. This year 127 cows are being milked. All herd replacements are reared on the farm, 20 heifer calves being kept each year. Calves are individually fed and receive full milk for the first four weeks. Then skim-milk is slowly added until the calves are wholly on skim-milk. After they are weaned they are put on the best grass available and are not allowed to receive any check.

Calving usually begins about July 10 and is completed by the end of August. The farmer also runs about 100 head of sheep, used mostly to control sidlings at the back of the farm and never allowed access to the main cow paddocks.

In the early days of settlement in Tauranga County it was well-nigh impossible to rear young stock on much of the higher country because of a deficiency of cobalt in the soil. Since cobalt has been applied either in lick or drench form, or in the fertiliser, the trouble has been overcome and the district can hold its own anywhere with the quality of its young stock.

Pigs

The profit to be made out of a well-managed piggery run in conjunction with the dairy herd is well appreciated on this farm. The pig lay-out is good, with well-built sties and an ample run-off on to grass.

The 12 sows kept are of the Tamworth-Berkshire cross, and they are mated to a Large Black boar. Most of the pig food is produced on the farm, though barley, butchers' fat, and molasses are bought. Last year £60 was spent on food for the pigs and the value of the pigs sold was £410.

The first litters are produced in August and are sold as forward stores to the buttermilk buyers, being fed on ground barley or maize, skim-milk, fat, and grass.

The second litters are farrowed in February, carried as stores through the winter on carrots, maize and kumikumi, barley and fats, and sold in the early spring.

Implements and Plant

The investment in implements and plant is not excessive considering the

Ample troughs assure that stock have access to water at all times.

size of the farm and the amount of cropping carried out. There is the usual range of cultivating and harvesting implements common to all dairy farms, and in addition there is a 17-horsepower tractor and a hay baler.

Buildings

There are two houses on the property to accommodate the owner and his staff, and two well-built hay barns, each capable of holding 1,800 bales of hay. The cowshed is fitted with a six-cow plant, and there is a large implement and manure shed and a maize crib.

Labour

Three milkers are employed on the property, and they and the farmer do all the farm work.

It is stressed that the farm under discussion is a typical large dairy farm in Tauranga County. No effort has been made to select a unit with record production figures, the aim being rather to describe operations on a well-managed unit where dairying is the main occupation and a certain amount of cropping is carried out.

Acknowledgments

Thanks are expressed to the Soil Survey Division of the Department of Scientific and Industrial Research for data in the soil map and to the Lands and Survey Department for the drawing of the maps.

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Pig Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in July, 1946, as follows:—

Auckland—1YA, on July 17, at 7.15 p.m., "Feeds and Feeding," by H. E. Clark, Supervisor, Auckland District Pig Council.

Wellington—2YA, on July 16, at 7.15 p.m., "Avoiding Losses in Pig Production," by R. O. Roderique, Supervisor, Taranaki District Pig Council.

Christchurch—3YA, on July 18, at 7.15 p.m., "Answers to Questions," by H. W. Macintosh, Supervisor, Canterbury District Pig Council.

Napier—2YH, on July 9, at 7.15 p.m., "Litter Production," by H. H. Hopkins, Supervisor, Tairawhiti District Pig Council.

Registration as an Onion Grower

TO avoid misunderstandings in the minds of producers, the Department points out that while an onion grower is not required to register the acreage planted in onions under the provisions of the Commercial Gardens Registration Act, 1943, he is, however, required to register under the Board of Trade (Onion) Regulations, 1938, a clause from which is quoted below for the information of growers of onions:—

> **"Every person who being an onion grower or a wholesale onion merchant fails to make an application for registration as an onion grower or as a wholesale onion merchant pursuant to the provisions of these regulations is guilty of an offence against these regulations."**

No fee is payable for registration as an onion grower or as an onion merchant. Application forms may be obtained from the Director, Fields Division, Department of Agriculture, P.O. Box 3004, Wellington.

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BEESWAX FROM COMBS

Protecting a Valuable Asset

By E. SMELLIE, *Apiary Instructor, Christchurch.*

HONEY-EXTRACTING combs are the beekeeper's most valuable asset apart from his bees. Special care should therefore be taken to protect them from damage or deterioration during the off season when they are not in use on the hives. Common factors which contribute to loss or damage of combs are mice, mould, and wax moth infestation. Usually there is more trouble from these causes when combs are stored on the hives, in supers out in the open, or in open sheds, than when they are stored in sound buildings.

IF dry, empty honey combs are stored and kept dry in neat-fitting supers, with a wooden mat or a queen-excluder placed at the top and bottom of each tier, effective protection against mice and the development of moulds will be obtained. To protect the combs from the ravages of wax moths, however, more detailed precautions are necessary, particularly in warm districts where the moths are more prevalent.

Wax Moths

There are two species of wax moth, the greater (*Galleria mellonella*) and the lesser (*Achroia grissella*). The former is established in most parts of the North Island and in isolated warm areas in the northern portion of the South Island; the lesser wax moths are more or less general in both islands.

Larvae of the larger wax moth, when fully grown, are about an inch long, and are much more destructive to the combs than the smaller species. They burrow galleries through the combs under the protection of strong silken webs which they spin round themselves while eating their way forward. Bee-combs attacked in this manner are soon destroyed.

Control Measures

In districts where these moths are prevalent the only sure method of control is to keep the combs in a moth-proof building, or one which can be closed for periodic fumigation. Where a suitable building is available, and it is desired to fumigate bee-combs already affected, the supers in which they are stored may be placed criss-cross in tiers and calcium cyanide placed about the room on sheets of newspaper.

The active agent of calcium cyanide is liberated in the form of hydrocyanic acid gas, which is a deadly poison to all life. Therefore caution is necessary when this chemical is used. The operator should leave the building as soon as possible, and tightly close all windows and doors for at least 24 hours. Before re-entering the building a free circulation of air should be allowed by leaving the doors and windows wide open for a long period during daylight.

Supers and combs stored out-of-doors or in open sheds can be fumigated by piling the supers in neatly-fitting stacks on floor-boards and by covering each stack with a hive lid. A level dessertspoonful of calcium cyanide placed on paper, or sprinkled inside and underneath the combs in the bottom super, will be sufficient for a stack of six supers. The entrance to each stack should be closed with a wooden block immediately the gas has been applied. A fresh application may be made a month later and repeated whenever circumstances dictate.

Other Repellants

There are other strong-smelling fumigants which have been used for the protection of combs in storage against wax moth infestation, such as paradichlorobenzine, moth-balls, and naphthalene. Their use, however, cannot be recommended for this purpose when the combs are damp or during long periods of storage. Though the gases released by these preparations are not injurious or unpleasant to smell, if used to excess they will taint the bee-combs with their characteristic odours. Honey stored in them the following season may absorb odours which would seriously impair its natural flavour, and thus be spoiled for all marketing purposes.

Rendering Beeswax

There are three classes of material to deal with in obtaining beeswax: Butt or brace comb, comb capping, and old or damaged combs. The most difficult to deal with are damaged combs, especially when they have been used in the brood-nest for a number of years.

Beekeepers have evolved various methods to salvage the wax content of old combs, but the most satisfactory are those which utilise pressure combined with hot water.

Hatch Wax Press

Very simple and strongly constructed, the Hatch wax press, though not expensive, is the best and most conveniently operated device for the

Super of bee-combs destroyed by larvae of the greater wax moth.

salvage of clean beeswax from old combs with the aid of hot water.

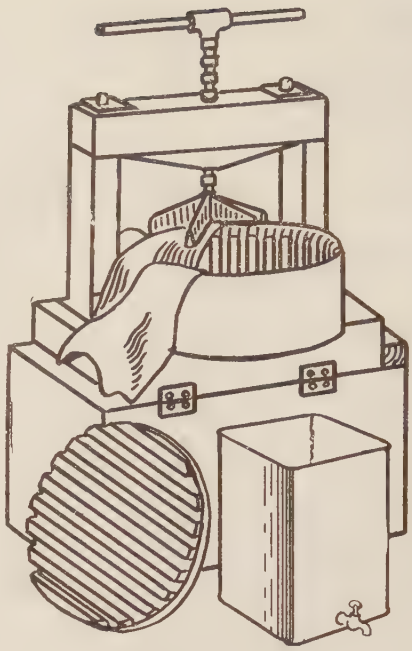
The press should be placed on a bench with hinges at the front, so that it can be tipped forward with safety. Other equipment required consists of a large copper boiler, a few clean sugar bags, a dipper, and a number of 4-gallon tins with their tops removed.

Pressing Procedure

The boiler should be filled a little over half full of water and brought to the boil. If the water is hard the beeswax may saponify and less wax will be secured, so it is advisable to use soft rain water. If only hard spring water is available, a pint of vinegar added to every 10 or 12 gallons of water is helpful. When the combs have been cut out of the frames, they should be broken up and added to the boiling water until the boiler is nearly full.

Pressing should not begin until the combs are reduced to a steaming mass, or a considerable amount of the wax available will not be salvaged. When the contents of the boiler are ready, the press and component parts should be thoroughly warmed with boiling water. A sugar bag with the seam on one edge cut about a third of its length is opened out inside the can.

With the use of a dipper, about 2 gallons of the melted comb and water are poured into the bag for pressing.



Hatch wax press.

the bag is neatly folded over, and the cleated follower board placed in position. Pressure is applied to the contents by turning the screw a little at a time. When the screw is down, pressure should be released slightly to allow free draining of any pockets of liquid brought about by the first squeeze, then re-applied slowly until the screw is hard down, and left for a few minutes. The press is then tilted forward to drain off all liquid wax and water into the receptacle provided. A 4-gallon tin with a tap is best, as it allows most of the water below the wax to be drained off at the bottom and returned to the boiler. The wax is then poured into a tin for moulding. To complete the process the slum gum, or cheese, is shaken out of the bag into an empty box.

The tins used as moulds should be covered with several layers of sacks to prevent rapid cooling and allow dirt and impurities to settle. This dirt forms a thin layer on the bottom of the wax, and is easily scraped off when the wax has solidified.

SHARPENING BLADE SHEARS

Shearing machines have largely displaced blades on the low country of New Zealand, but blades are still widely used on the high-country sheep stations of the South Island. On every sheep farm shearing jobs which do not warrant the starting of a machine will crop up. Shearing with blades is much easier if the shears are properly sharpened and set, and a new Department of Agriculture bulletin explains and illustrates the correct methods. To obtain a **free** copy write to the Department of Agriculture at Auckland, Wellington, Christchurch, or Dunedin, or to "The Publisher, Department of Agriculture, Box 3004, Wellington," asking for Bulletin No. 261, "Sharpening Blade Shears."

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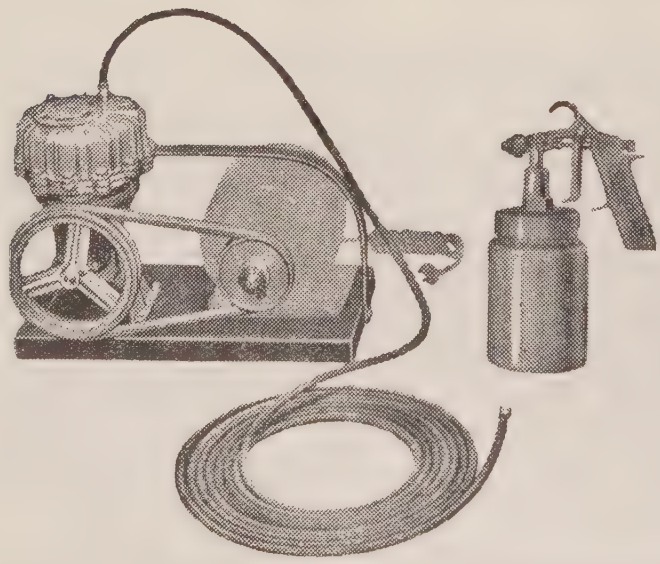

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PREPARING LAND FOR SPRING-SOWN FODDERS

By C. WALKER, *Instructor in Agriculture, Thames.*

IN speaking of livestock it has often been said, with a great deal of truth, that "More than half the breeding lies in the feeding"; and so often has this proved to be correct that it is now practically accepted. Equally well can it be claimed in respect of crops and cropping that a great deal of the success in growing an annual crop will depend on the efficiency with which the land is prepared to receive the seed.

Quite frequently, and particularly in a season such as the past one, there are many instances of crop failure that can be traced directly to inefficient soil preparation. When such preparation is followed by dry conditions like those experienced in parts of the North Island during the past summer, there is really no hope of any crop succeeding.

GOOD preparation consists of working the land sufficiently in advance of sowing to provide for good soil tilth, a complete rotting of the turf, and a good conservation of soil moisture. In practice farmers often leave the initial ploughing to the last minute, rush their discing and harrowing through, and sow on a seed-bed that is only partially prepared. Of course, when the season is particularly favourable they may get a reasonable crop, but they never get a good one. On the other hand, if the season is unfavourable they have complete failures for which the season, the seed, or some other factor is blamed. The real cause of such failures, however, is the inefficiency of preparation.

Early Ploughing

What is good soil preparation for a spring-sown crop? It can be achieved only by an early ploughing that will permit all turf to decompose completely and become incorporated in the soil before the time for sowing. Where an old grass sward is to be broken up for cropping the ideal procedure would be to skim plough the area in the late autumn or early winter, and allow it to remain in the furrow and exposed to the weather until the following spring.

As soon as weather permits the land should be disced to break up the turf, ploughed to a depth of 6 to 8in. across the skim ploughing, and worked down to a fine tilth with discs and tine harrows. Where comparatively small areas are being cropped, as on the average North Island dairy farm, a further ploughing of the prepared ground about a week before sowing will be found advantageous, but where large areas are to be handled this can be omitted.

Finally, before sowing, the whole area should be rolled to give that measure of consolidation that will lead to good crop germination. A further rolling immediately after sowing will ensure a good strike and eliminate any chance of seedling mortality if a dry spell should follow germination.

Good preparation along the lines suggested is insurance against loss and seldom fails to pay a handsome dividend, not only in the certainty of a crop but also in enhanced yields. Poor preparation, on the other hand, is nothing better than a gamble with the odds heavily weighted against the farmer who adopts this method of soil cultivation.

Feed Requirements

In the planning of feed requirements farmers should always err on the side of being liberal rather than find themselves short of feed at any particular time. In any feeding system for the dairy cow it is as well to bear in mind that she will require from 22 to 25lb. of dry matter a day. Needless to say this will not be fed as dry matter, but may be supplied as green fodder, pasturage, or in the form of root crops, provided the dry matter content is equal to requirements.

To arrive at some idea of what quantities of various crops correspond to the requirements of the dairy cow, the figure of 22 to 25lb. of dry matter should be multiplied by 10 to obtain the weight of roots such as turnips, mangolds, carrots, or sugar beet, and by 4 for green crops such as maize, millet, oats, or lucerne. In calculating requirements of hay add one fifth to the weight of dry matter needed to satisfy the cow's appetite. In other words, if a cow requires 25lb. of dry matter she should have 30lb. of hay. Of course, 30lb. of hay or 250lb. of roots would not comprise a suitable diet for the dairy cow, whose requirements are better met by supplying a mixture of dry and watery foods. In feeding a root supplement it is desirable to limit the total daily ration to about 40 or 50lb. to a dairy cow and make up the balance from pasturage, hay, greenfeed, or silage. Overfeeding on roots alone would lead to digestive troubles, as ruminants must be provided with some bulky fibrous food in addition to, say, soft turnips and mangolds.

On many dairy farms one of the main objectives in cropping will be to provide an adequate supply of winter crops for the feeding of store pigs; maize, barley, swedes, sugar beet, and artichokes will be most suitable. Each store pig will require about 2½ bushels of grain to carry it through the winter. Thus, a 50-bushel maize crop would provide enough grain for 20 store pigs. With root crops such as swedes the area should be based on the number of pigs to be carried, and for this purpose one acre will usually provide all that is required for the progeny of four sows.

Summer and Winter Feeding

For summer feeding of dairy cows on green supplements such as green maize or millet a fairly safe basis is to provide one acre for every ten cows if a full two months of feeding is expected. Should the period of feeding be shorter, or where there is reasonably good summer pasturage on part of the farm, this rate of provision can be reduced.

For winter feeding of roots an acre of swedes or mangolds will provide reasonably good feeding for two to three months for 20 cows, provided that a hay supplement is also given. In the feeding of sheep, soft turnips and rape will be preferred for summer supplements and for topping off lambs. A little hay for roughage should be made available where grass cannot be provided. For sheep feeding an acre of the above crops, provided it were rationed in breaks, would provide ample for 50 head for a month. Turnips and swedes, together with a little chaff or hay, will meet the position in winter on most sheep farms dependent on cropping. Here again an acre of crop for every 50 head will suffice for a month's feeding.

Generally, the areas of crop recommended are liberal and provide for only average yields. However, surpluses are never embarrassing, but shortages can be exceptionally so.

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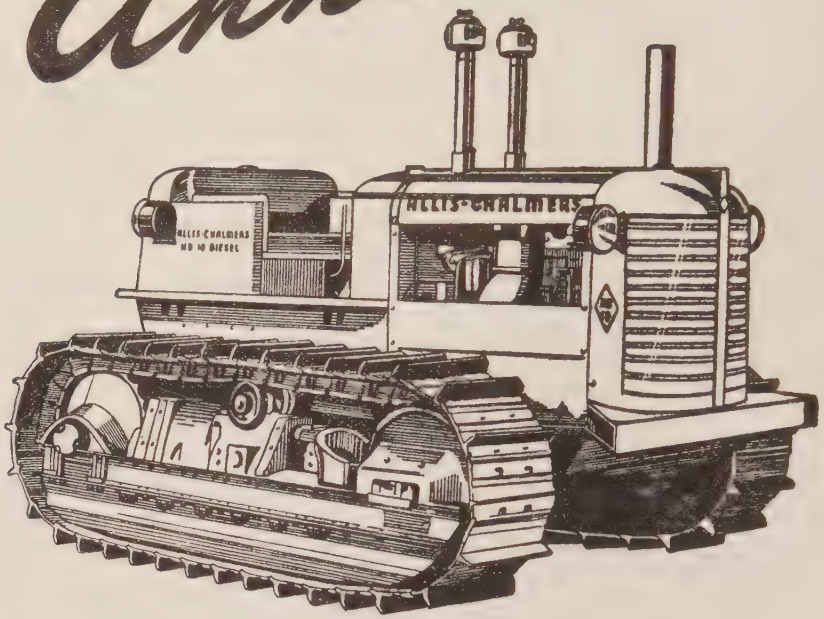

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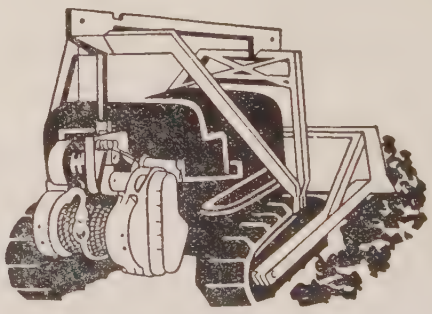


PARENT material, climate, vegetation, and slope are the principal factors governing the formation of soils in the South Island, discussed here by L. I. Grange, of the Soil Survey Division, Department of Scientific and Industrial Research, Wellington. In the "Journal of Agriculture" for April, 1945, he dealt with North Island soils.

GREYWACKE and schist are the characteristic parent materials of South Island soils. Greywacke was formed from sediments laid down in water and subsequently hardened by earth pressure. Mica schist was formed from similar sediments, but more intense earth pressures developed platy crystals of mica which cause the rock to split into flat fragments when weathering at the surface. Greywacke on the other hand splits into angular pieces. The two rocks are identical in chemical composition and give rise to similar soils where other soil-forming factors are the same.

On steep slopes the soils are derived directly by weathering of the greywacke, schist, or granite; but on the easy slopes of much of the lowland country the soils are formed from loess—a wind-blown deposit several feet thick laid down a million or so years ago when the glaciers were much more extensive. The glaciers eroded the greywacke and schist over which they moved, and the rock flour produced reached the rivers emerging from the terminals of the glaciers. The wide channels of the rivers favoured the evaporation of the cloudy water, leaving the dust to be lifted by wind and deposited over the surrounding country. In other lowland districts the soil on the easy land is derived from the young deposits of greywacke gravels, silts, and clays left by rivers.

Over large areas on the West Coast, in western Southland, and in Stewart Island the soils are derived from granite, but such areas are mostly in forest and of small potential value for agriculture. Granite, an igneous rock intruded into the earth's crust and exposed later by erosion of the overlying sediments, is like the North Island rhyolites in composition.

In a few localities on the east coast, such as at Oamaru and to the south of Dunedin, the soils on steep slopes are formed from mudstone, sandstone, and limestone. Similar parent material forms the hilly country near Greymouth and to the south of Westport.

Volcanic rocks—basalts, andesites, etc.—are the parent materials of the soils on steep slopes on Banks Peninsula and at Dunedin.

Rainfall

The greater part of the West Coast receives more than 100in. of rain a year. Rainfall is much less on the east coast. In Central Otago there is a dry belt with less than 20in. a year—as low as 13in. at Alexandra. The Blenheim district, the coastal portion of the Canterbury Plains, South Canterbury, and Eastern Otago have slightly less than 30in., and in the remaining districts the rainfall ranges between 30 and 60in.

Vegetation

Except for isolated areas of forest, the original vegetation on the eastern side of the Southern Alps from Blenheim to Balclutha was tussock, which also occurred fairly extensively in Southland. The total area of tussock was more than 14,000,000 acres, and it is still the dominant vegetation. On the west coast of the South Island, in Nelson, and in parts of Southland much of the original forest still remains, and consists of two types—mixed forest (rimu, rata, etc.) and beech forest.

DESCRIPTION OF SOILS

In the South Island parent materials are more uniform than in the North Island and, climate being the dominant factor in determining the soil-group boundaries, the broad pattern of the soil map is less complex than in the North Island. Eight groups of soil are shown on the map:—

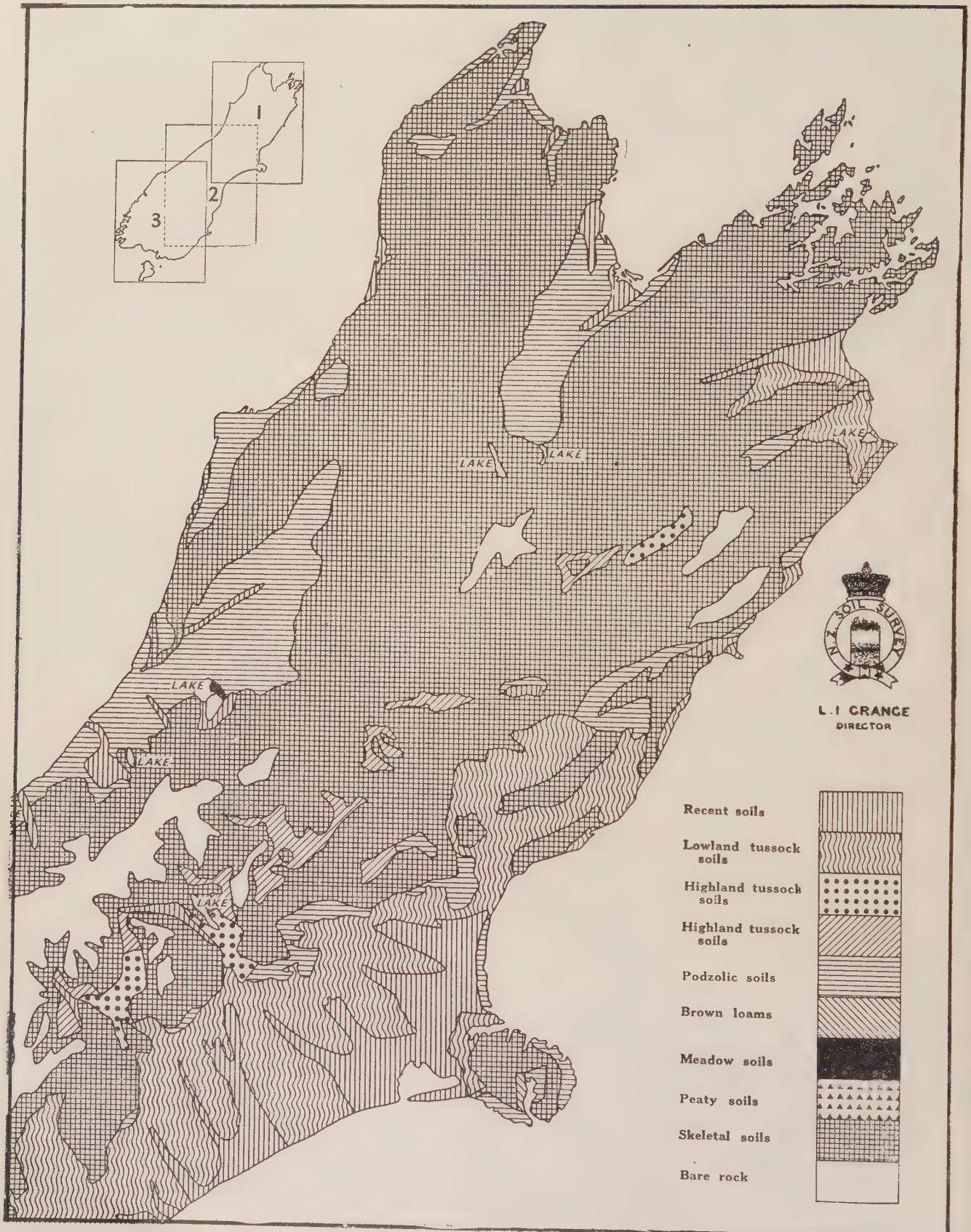
1. **Recent soils.**
2. **Lowland tussock soils.**
3. **Highland tussock soils (two divisions).**
4. **Podzolic soils.**
5. **Brown loams.**
6. **Meadow soils.**
7. **Peaty soils.**
8. **Skeletal soils.**

Divisions within soil groups 2, 3, and 4 based on extent of leaching have been recognised, but except for two broad divisions in the highland tussock soil group the scale of the map is too small to show the progressive stages.

1. Recent Soils

Recent soils are derived from river alluvium deposited within historic times, and some are being added to during present-day floods. A typical area is the flood plain of the Waimakariri River which extends from Rangiora through Christchurch to Lake Ellesmere. Other areas are the flats bordering the Waimea, Motueka, and Riwaka Rivers in Nelson, the Wairau River in Marlborough, the Rakaia, Ashburton, Opihi, Taieri, Clutha, Mataura, and Oreti Rivers in Canterbury, Otago, and Southland, and the Karamea, Grey, Hokitika, Wanganui, and Cook Rivers on the West Coast. Except where stony or

[*Photograph in heading by Internal Affairs Dept.*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Highland tussock soils
Highland tussock soils
Podzolic soils
Brown loams
Meadow soils
Peaty soils
Skeletal soils
Bare rock

very sandy, recent soils are generally highly fertile and suitable for intensive farming.

2. *Lowland Tussock Soils*

The lowland tussock soils occur in Marlborough, Canterbury, Otago, and Southland on the easy rolling downs and terrace land between the coast and the foothills of the mountains. They are derived from loess or loess-like sediments and developed under 25 to 45in. of rainfall and a low tussock grassland vegetation. Topsoils are dark grey to black, and subsoils creamy yellow and compacted into a claypan at 18in. or more below the surface. Topsoil textures are remarkably uniform; silt loams are general on the rolling downs, and silt loams with a variable proportion of stones common on the flat terrace land. The soils are slightly leached, but the parent materials are low in phosphate and lime-bearing minerals; treatment with phosphate and lime is necessary, especially on the areas adjacent to the foothills, where leaching is greater.

A wide range in productivity results from differences in the moisture supply available to the plants. On the downs and on the flats where the soil is more than 24in. deep the plants suffer from lack of moisture only in very dry weather. But on the flats, where shingle lies only 9in. below the surface—as in the Maronan district a few miles west of Ashburton—the moisture is able to maintain only a sparse cover of low-fertility grasses such as sweet vernal. At Seafield, where the depth to the shingle is 11in., drought conditions are less severe, but there is still insufficient moisture to meet the demands of the better-fertility grasses. These shallow stony soils are usually referred to as the **light plains land.**

[*Soil Conservation Council photo.*

Recent soil, Canterbury Plains.

3. *Highland Tussock Soils*

Soils of the highland tussock group are found in Marlborough, Canterbury, Otago, and Southland, but in contrast to the lowland group they occur in the inland basins and high plateaux where they are subject to wide variations of climate. Tussock was the vegetation when settlement began, and the two divisions of this group shown on the map correspond approximately to the divisions between the low and tall tussock grassland—the result of differing climates.

The first division includes the soils of the inland basins where the rainfall is between 13 and 35in. a year and the native vegetation consisted mainly of silver, blue, and hard tussock, speargrass, and matagouri. The soils are grey-brown to light brown, the subsoil becoming more yellow with increasing rainfall. Textures range from sandy loams to gritty silt loams with weak powdery structures and easily eroded when exposed by destruction of the vegetation.

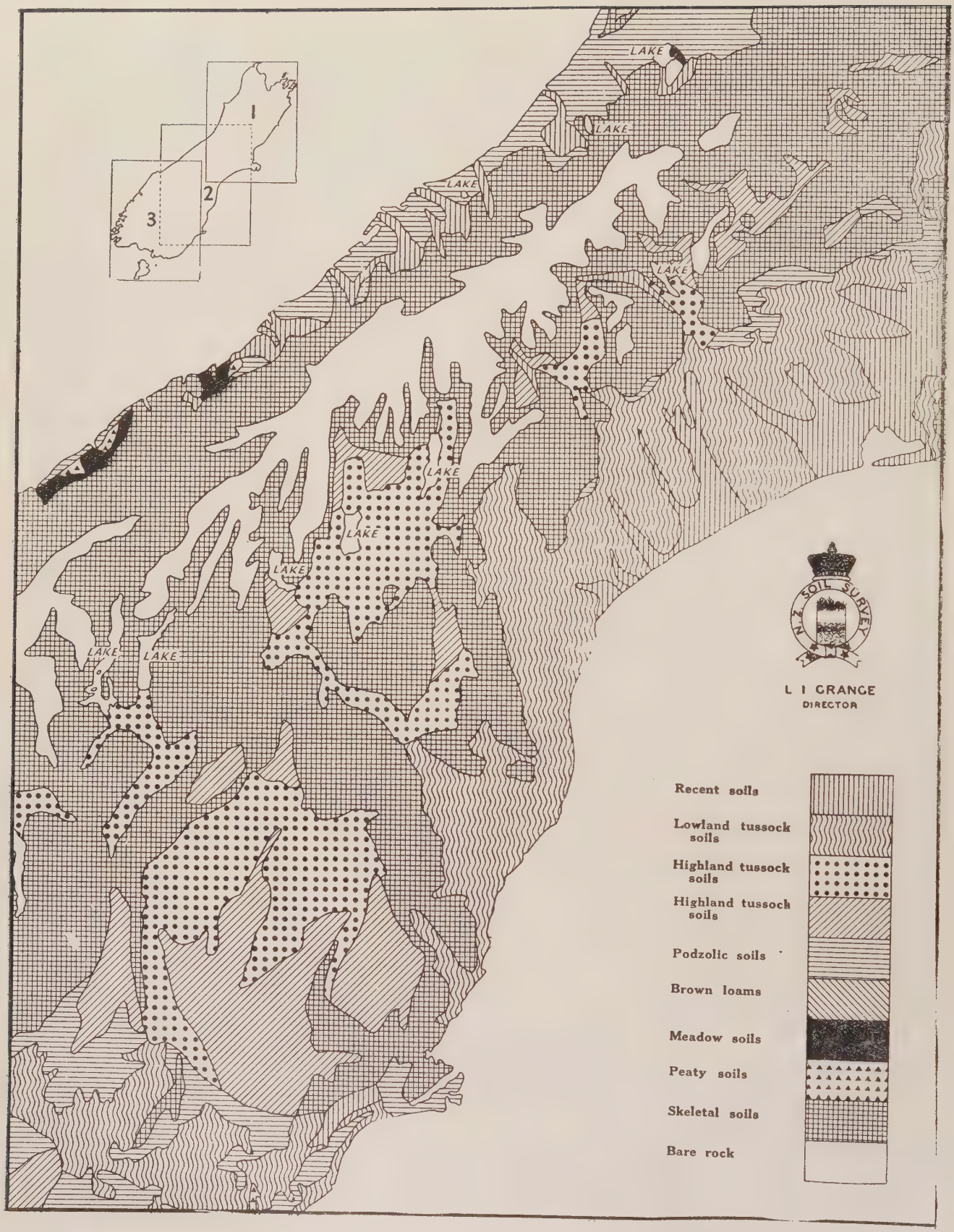
In the low-rainfall districts of Alexandra and Cromwell the soils are very slightly leached. As measured by content of plant foods, fertility is high, but productivity is limited by the amount of moisture. Given adequate moisture by irrigation, the fertility rivals that of the recent soils. In the Mackenzie Country and basins in the upper parts of the Awatere, Clarence, Rakaia, Ashburton, and Waitaki valleys the soils are slightly leached and have only a moderate fertility. Moisture is much less a limiting factor than on the Alexandra soils.

The second division includes the soils of the wetter zones of the inland basins, and the soils of the uplifted plateaux of Otago and Southland. The native vegetation was mainly snow tussock or red tussock, and the rainfall ranges from 30 to 60in. The surface layer is dark brown and the subsoil yellow. Light and loose in structure, the topsoil is rapidly removed by erosion when exposed. Considerable leaching has taken place, and according to chemical analyses there is usually a high lime requirement and a moderate need for phosphate.

4. *Podzolic Soils*

Podzolic soils are extensive in the wetter parts of the South Island, and like their counterparts in the North Island can be classified according to their stage of development.

(a) Young and immature podzols are developed from loess, sandstone, or mudstone under coastal broadleaf or black beech forest or scrub in areas with a rainfall of 30 to 45in. They occur in the Sounds, Upper Wairau, and Kaikoura districts in Marlborough, as a narrow belt of foothills country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Podzolic soils
Brown loams
Meadow soils
Peaty soils
Skeletal soils
Bare rock

extending from Hanmer Springs in North Canterbury to Kaitangata in Otago, in small areas near Greymouth, and in the Waikaia, Nightcaps, and Tuatapere districts of Southland. The topsoil is dark greyish-brown and the subsoil pale yellow to yellowish-grey. The soils have a firm compact structure and do not erode readily. They are less fertile than the adjoining lowland tussock soils; lime and phosphate are necessary to maintain good pastures.

(b) Semi-mature podzols cover large areas of Nelson, Westland, Otago, and Southland. They are developed on greywacke, granite, or sandstone rocks under a beech forest, scrub, or tussock vegetation. Rainfalls range from 40 to 70in. The topsoil is thin and grey and the subsoil yellowish-grey to deep yellow. On the Moutere Hills in Nelson and in the Catlins district in Otago the parent material is greywacke and the texture silt loam; where the soils are derived from granite, as at Glenhope and Sandy Bay, the textures are sandy loam. The soils are poor and require heavy dressings of lime and phosphate to maintain a cover of grass. On the soils derived from granite cobalt is needed to prevent bush sickness.

(c) Mature podzols occur on wide terraces on the shores of Golden Bay, on the West Coast from Karamea to Big Bay, and along the Inangahua, Grey, and Hokitika valleys. The rainfall is between 70 and 180in. a year. Judging from the presence of stumps and roots, forest was once extensive on these soils, the principal trees being silver, red, black, and bog pine. Now these are found in parts of Westland; elsewhere the vegetation is chiefly a swamp association of umbrella fern, pakihi rush, and moss, with manuka on the better-drained parts.

The topsoil of the mature podzols is a dark brown, peaty silt loam about 10in. deep lying on a grey silt loam. Between 18in. and 36in. from the surface is coarse shingle cemented by iron to form an impermeable pan, which is responsible for the permanent waterlogging of these soils. The soils are thoroughly leached of their plant nutrients, and experiments at Westport showed that heavy dressings of lime and phosphate are needed to maintain a pasture. Cobalt and other minor elements are in short supply. The drainage is very slow and the soils pug badly when grazed by cattle.

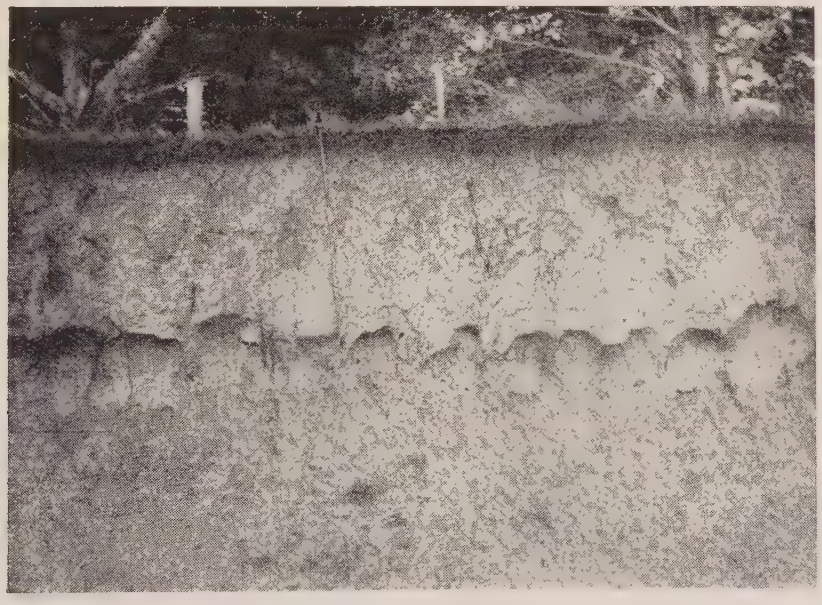
[*Soil Conservation Council photo.*

Lowland tussock soil, Seddon.

5. *Brown Loams*

Small areas of the three sub-groups of the brown loams occur in the South Island.

(a) Yellow-brown loams derived from glacial and alluvial sediments of greywacke, granite, and gneiss origin are found in the Lakes district of Southland. They are loose, powdery, sandy loams formed under totara or beech forest. According to analyses, they are moderately to strongly leached of plant foods such as phosphate and lime.



Lowland tussock soil, Hampden.

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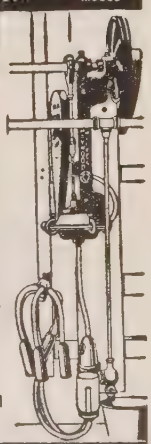

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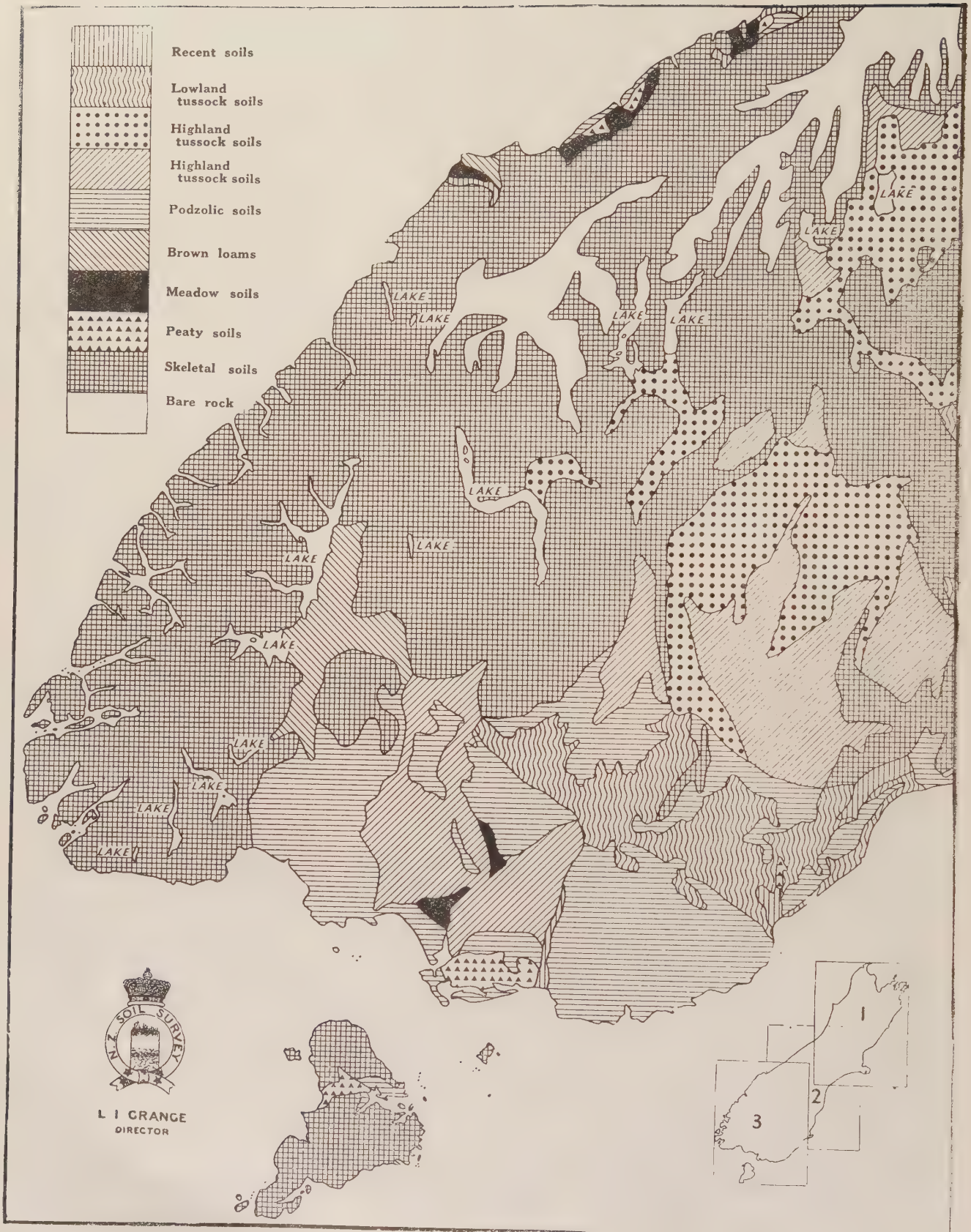
Recent soils
Lowland tussock soils
Highland tussock soils
Highland tussock soils
Podzolic soils
Brown loams
Meadow soils
Peaty soils
Skeletal soils
Bare rock
LAKE
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L I GRANGE
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1
2
3

[*Soil Conservation Council photo.*

Highland tussock soil, Upper Awatere Valley.

(b) Brown granular clays are derived from gabbro and norite in Southland and from serpentine in Nelson, Westland, Otago, and Southland. The areas are very small and the soils usually infertile.

(c) Red-brown loams occur where basalt outcrops in the Awatere Valley, on Banks Peninsula, near Waipiata, and around Dunedin. They are highly fertile soils but cover only a few square miles.

6. *Meadow Soils*

Meadow soils are developed on low-lying flats with the water-table close to the surface. The subsoils are white or light grey and generally heavy in texture. Many of the areas are now drained, but they poach badly in the winter. Small areas of high fertility occur near Rangiora and in the Flemington district near Ashburton; areas of lower fertility are near Invercargill and on the West Coast.

7. *Peaty Soils*

In swampy depressions water checks the decay of plant remains, which accumulate to form peat. Soils derived from peat occur in numerous small areas throughout the South Island. Most of them are strongly acid, poor soils not used for farming, but a few shallow swamps and margins of peat swamps have been drained, cultivated, and used for grazing with success. Peaty soils at Marshlands, north of Christchurch, are used for market gardening.

8. *Skeletal Soils*

Skeletal soils include all the steep hill country and for the most part are shallow soils closely related to the parent rock. They are extensive in the South Island, and sub-divisions corresponding to those of the easy land are recognised. Skeletal soils related to the tussock soils occur in Central Otago, and skeletal soils related to the podzolic soils occur in Nelson. Except for those related to the more fertile division of the highland tussock soils, the skeletal soils are poor and difficult to maintain as grazing country because of erosion or aggressive scrub and fern.

LAND UTILISATION

OF the total area of 66 million acres in New Zealand, nearly 43 million acres are occupied. The remaining 23 million acres comprise rivers, lakes, roads, forest and scenic reserves, and mountainous areas unfit for settlement.

Of the occupied area, 17,489,548 acres (40.7 per cent.) are in sown grassland and a further 13,869,330 acres (32.3 per cent.) are in tussock or other native grassland; sown and native grassland together cover 73 per cent. of the total occupied area. Approximately 1¼ million acres (2.9 per cent.) are sown in field crops, and a further 230,000 acres are fallow or used for orchards, market gardens, etc. Of the remaining area, 860,000 acres (2 per cent.) is in plantations, 2,886,000 acres (6.7 per cent.) in forest, and 6,393,000 acres (14.9 per cent.) is in scrub or other unimproved areas.

The 17½ million acres of sown pasture land consists of approximately 11 million acres of surface-sown hill grassland established after forest or scrub fires and 6½ million acres of pasture sown on ploughed land. The 1¼ million acres in crop include nearly ¾ of a million acres in supplementary fodder and root crops. Adding this area to that in grassland, stock are grazed on approximately 32½ million acres. This may be sub-divided according to the type of farming practised, and estimated areas are shown in the following table.

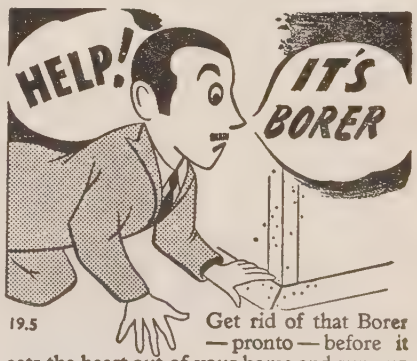
TYPE OF FARMING.	ESTIMATED AREAS IN MILLIONS OF ACRES.		
	North Island.	South Island.	Total.
Dairying	3.3	0.5	3.8
Fat lambs and other fattening farms ..	2.5	2.3	4.8
Hill sheep farms ..	8.0	14.5	22.5
Lowland sheep farms — little or no fattening ..	—	1.4	1.4
Totals	13.8	18.7	32.5

Problems of land utilisation can be considered according to the topography of the country, since utilisation is mainly dependent on this factor. The acreage of soils in the North and South Islands on topographic basis is:

TOPOGRAPHY	NORTH ISLAND.	SOUTH ISLAND.
	(acres)	(acres)
Flat and rolling ..	8,144,000	4,789,000
Hilly	48,281,000	31,752,000
Steep	14,740,000	

Flat and Rolling Land

With the exception of the types mentioned later, the use of flat and rolling land presents no problems beyond the application of fertilisers and drainage. The soils generally require dressings of lime and phosphate for pastures and most crops. Exceptions for lime and phosphate are the first bottom lands, and for lime the pumice soils and immature soils derived from mudstone. Sandy soils in high-rainfall areas need potash as well. The lime requirement of all the country's soil types is known from soil studies and



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from responses on small trial plots. This provides a sound basis for tests of soils from farmers' fields to find the amount needed on a particular field. A fourfold increase or more in liming of the flat and rolling land is necessary to bring the soils to a lime content that plants demand for best growth. Tile and mole drainage of heavy loams is practised on some farms, but more could be drained in this manner to increase carrying capacity.

The agricultural utilisation of the following ploughable soils has presented difficulties:—

(a) Mature brown loams and related soils derived from basic volcanic rocks, locally called ironstone: On cultivation these work up to a good tilth, but so far, even with heavy dressings of lime and phosphate, pastures deteriorate rapidly. It is likely that phosphate fixation is the limiting factor. Their total area is 100,000 acres.

(b) Deep peaty soils: These are very acid and contain practically no plant foods. As well as the heavy dressings of all fertilisers required to establish pastures, the peats present moisture and fire problems. With ordinary drainage they become too dry in the summer and too wet in the winter; control of the water level by floodgates might effect some improvement. Fires form depressions that become waterlogged. Their total area is 100,000 acres.

(c) Sand podzols: The pan in these soils maintains the water table at or near the surface in winter and in the summer the soils dry out badly. All plant foods are in extremely low supply. The area of sand podzols is 130,000 acres.

(d) Ground water podzols: The ground water podzols, locally called pakihi soils, occur in districts with rainfalls ranging between 80 and 150in. a year. In winter the ground poaches badly, and the absence of suitable run-off country for stock in the winter has prevented their development. The high rainfall causes rapid leaching of fertilisers, with the result that heavy applications of lime and superphosphate would be needed each year. Their area is 250,000 acres.

(e) High-altitude land: Easy land lying above about 2,000ft. has too short a growing period for pastures to be suitable for agriculture. Most of this land in the moderate to high rainfall areas has been taken for commercial forestry.

Altogether the easy land not adapted to agriculture is relatively small in total area—less than 1,000,000 acres.

Hilly Land

Hilly land is the moderately-steep class with slopes between 12 and 30 degrees.

Scrub land can generally be brought into pasture if fertilisers—lime and phosphate—are broadcast. Sowings after forest burns come into good pasture, but deteriorate if not topdressed. On many soil types care must be taken that soil is not eroded, and this can be achieved mainly by obtaining a close pasture cover. Where slips occur, as on hard mudstone and sandstone country, widely-spaced trees may be necessary to hold the soil.

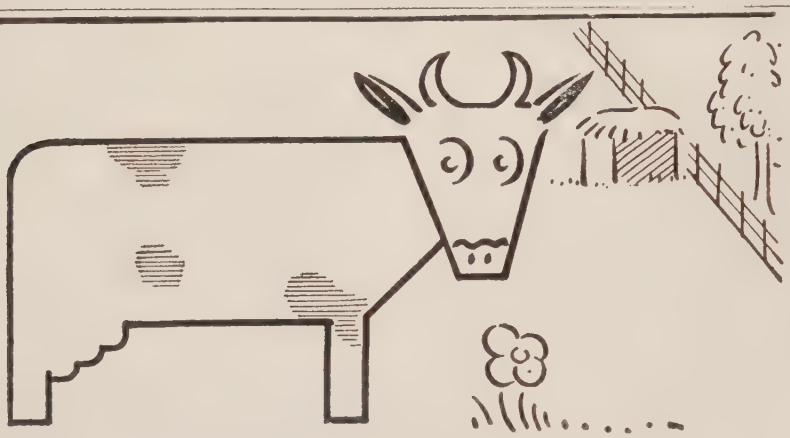
Hilly lands not used for agriculture or employed only for poor-class grazing are:—

(a) Semi-mature podzols: The vegetation is low scrub, with rush in badly-drained patches. A suitable seed-bed for pasture cannot be obtained after burning the scrub; this, together with the difficulty of dealing with the badly-drained patches, excludes these soils from agricultural use.

(b) Pumice soils: On hilly land pumice soils are difficult to bring into pasture because they erode by wind and water before a close sward is obtained. Some are already partly eroded by the opening of the scrub vegetation by fires.

(c) Very low-fertility soils: In the southern part of the South Island there are several hundred thousand acres of hilly soils that are reverting to scrub. In some cases holdings have been abandoned. Dressings of phosphate and particularly lime beyond payable amounts are required.

The pumice soils and very low-fertility soils are better adapted to protective forests.



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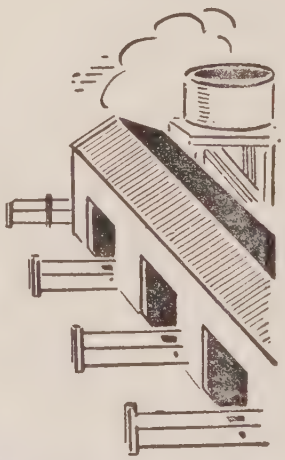

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Ground water podzol, Hokitika.

Steep Land

The utilisation of steep land—slopes of 30 degrees and more—is New Zealand's greatest land problem. This class of land occupies about 60 per cent. of the total area.

Erosion is the limiting factor—wind and water erosion removing topsoil, slips removing topsoil and subsoil. There is only one kind of soil that presents little or no problem in its use: The soils of high fertility, which are mainly derived from slightly calcareous mudstone. Though some slips occur, they soon grass over completely.

More than half the steep soils are grazed by sheep and cattle, but many of the runholders are faced with the difficulties caused by loss of fertility because of soil erosion. Soil loss occurs on the following classes of country:—

(a) Low-rainfall high country of the South Island: A soil erosion survey of the high country shows that on a total area of 10,000,000 acres more than 75 per cent. of topsoil has been lost on 623,000 acres, 50 to 75 per cent. on 1,500,000 acres, and 25 to 50 per cent. on 3,000,000 acres, through sheet erosion by wind and water. There are two causes for the depletion of the native tussock vegetation: Grazing by sheep and rabbits, and burning. Soil loss followed the opening-up of the cover and is greatest in the districts of lowest rainfall (17in.). Factual data are required on the effect of burning —whether burning should be prohibited or allowed at a certain time of the year—on spelling, and on the introduction of palatable plants. A station on which these experiments could be made is being sought where methods could later be demonstrated.

(b) Moderate- to high-rainfall country, chiefly in the North Island: Sheet erosion by water and wind occurs on soil derived from rocks low in plant food and minerals. Before grazing began the soils were generally thin—about 4in.—and now many patches occur where soil is absent. Most of this land should be planted in protective forests. Slipping is common in the North Island; it is prevalent on a greater area than is the sheet erosion. Its influence on grazing depends on the nature of the subsoil or rock exposed. Some slips expose a brown-yellow loam that grasses over slowly; some expose soft sandy material of low fertility on which recovery is very slow and the resultant pasture not as good as the original; others have hard rock on which a soil develops extremely slowly, the first vegetation being moss. On soft mudstone slips occur repeatedly, developing large gulches. Grazing can be carried out under all types of slipping except on much of the land that exposes hard rock faces and on that which forms large gulches. Where the land is suitable for grazing despite the slips, some means of lessening slipping should be tried. The most promising is the planting of widely-spaced trees. The remedy on the bad slipping country is protective forest.

The limits of use of steep land types for grazing are now being investigated. It is probable that some of the grazing land will be planted in protective forest, mainly because of soil erosion. But production lost by this action can be more than overtaken by the use of fertilisers on the remainder. A big improvement in carrying capacity of the hilly country will also take place with the use of fertilisers. In the process of adjustment care must be taken that afforestation is not overdone. Steep and hilly land that cannot be topdressed economically may need to be subsidised in the interests of the State. On the land that is held in pasture there are erosion problems, but they cannot be classed as alarming and can be solved largely by common-sense methods.

Acknowledgment

Thanks are expressed to the Lands and Survey Department for the sectional drawings of the soil maps used in this article.

Filly's Injured Eye

"D.J.O.," Kaeo:—

Recently I purchased a three-year-old unbroken filly, who had what appeared to be one wall eye on the near side. Upon breaking her in I found that although she could see, her sight in that particular eye was very short, and she is extremely nervous of any grey or white objects on that side.

From the right ear down across the forehead to the left eye (the affected one) under the skin is a hollow in the bone about the length, width, and half depth of an index finger. The eye appears to have a film over it, very similar to the white of an egg, on the outer rim, and darkening to pale blue over the pupil, with a couple of brown spots showing through, which I take to be part of the pupil, hence her ability to see. The normal shape of the eye should be semi-oval, instead of which it assumes a conical shape, the point of which is over the pupil.

If this growth is caused by an injury, is it possible to have it removed?

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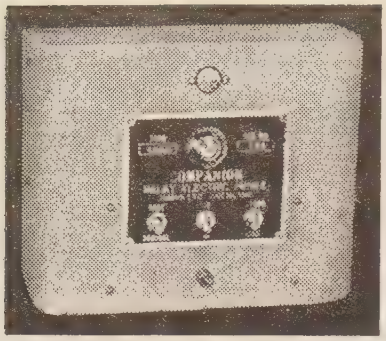
It is practically impossible without a careful examination to give an opinion of any value on the condition affecting the eye of your horse. It would appear from the description given that it has received a severe injury with a possible puncture of the outside layer of the eyeball; if this is so, the conical shape is not caused by a growth but is the result of the natural healing of such a wound. Treatment is not likely to give satisfactory results; giving an eye bath four times daily for a few weeks might be beneficial. Dissolve 30 grams of sulphate of zinc in a pint of water, pour a fair amount into the palm of the right hand, and, while facing the horse, press the lower edge of the hand firmly against the skin immediately below the eye; then close the hand and solution quickly over the eye. This will cause the horse to blink and allow the solution to cover the eye.



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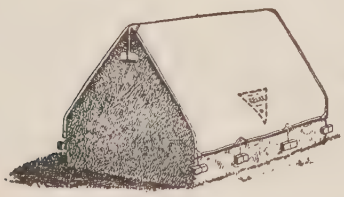

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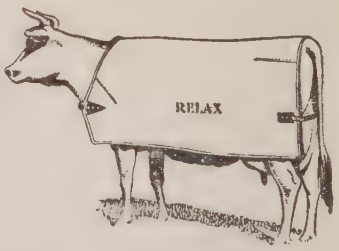

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Establishing a Citrus Orchard

TO ensure successful results a citrus orchard needs to be carefully planned before being established. In this article P. Everett, Orchard Instructor, Kaikohe, deals with the different aspects of citrus fruit growing which must be fully considered by either the prospective grower or the grower who contemplates enlarging his orchard area.

BEFORE planting a commercial citrus orchard it is important that due consideration should be given to the many factors essential for its success.

These factors include the following:

1. Suitable soil type and aspect.
2. Preparation of soil.
3. Provision of adequate shelter.
4. Good drainage.
5. Time of planting.
6. Selection of best kind, varieties and strains.
7. Desirable root stock.
8. Well-grown trees.
9. Extent of area to be planted.
10. Provision for maintenance until bearing.

Growers should realise that their first step should **not** be the ordering of trees or buying of land, but rather to make themselves thoroughly conversant with the points outlined above for the kinds and varieties of citrus they contemplate planting. When the orchard has been planted it is too late to change root stocks, soil type, aspect, and other factors having an important bearing on the commercial side of the undertaking.

Helpful information concerning New Zealand grapefruit, oranges, and mandarins will be found in the Department of Agriculture's Bulletin No. 241, advice concerning lemons in Bulletin No. 96, and in Bulletin 206, "How to Establish a Citrus Orchard."

Ordering Trees

Trees for new planting should be ordered as far in advance as possible. This is particularly important under present conditions, when the demand for high-quality trees is likely to be in excess of the number available. In ordering trees the following specifications should be made:

1. Name of root stock.
2. Variety of bud-wood.
3. The actual tree from which bud-wood is cut.
4. Height at which budding should be done.
5. Length of main trunk.
6. An assurance that all weak root stock seedlings have been discarded before budding is done, and that all weak budded trees will be similarly discarded before delivery is made.

Placing orders at least two years in advance of requirements enables the nurseryman to bud trees in accordance with known requirements. The kind of root stock recommended for most varieties and localities is sweet orange, which appears to be more resistant to diseases of the trunk than citronelle and also tends to prolong the profitable life of the tree. The dwarfing influence of *Poncirus trifoliate* stock makes it unsuitable for use in commercial orchards, except perhaps in a few exceptional circumstances. Trees should possess a clean, straight trunk not less than 2ft. 6in. in length, and to assist in minimising losses from bark diseases in later years it is desirable that the bud union should be 1ft. or more above ground level.

As there are different strains of nearly all varieties of citrus, it is important that trees should be propagated from the most suitable strain of the variety. It is sound commercial practice to purchase the trees one year before planting out is planned. They can be set out in nursery rows in a well-sheltered position adjacent to the area to be planted, and the final planting can then be made with the least possible check to the trees.

Thorough preparation of the soil and provision of adequate shelter are essential for successful establishment of a citrus orchard.

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Grapefruit Marketing Regulations

WITH the approach of the harvesting season for New Zealand grapefruit it is timely to remind growers of certain provisions of the New Zealand-grown Fruit Regulations, 1940, controlling the marketing of this fruit.

Regulation 2 defines "Dessert" grapefruit as grapefruit of the type of poorman orange known as Morrison's Seedless strain or other seedless strain substantially similar thereto and includes any other grapefruit having **a degree of maturity suitable for dessert.** "Marmalade" grapefruit means grapefruit of the type of poorman orange not included in the definition of "Dessert" grapefruit, and any other kind of grapefruit or sour orange having a degree of maturity suitable for marmalade.

Fruit picked early in the season before it is tree ripened and fully coloured is fit only for use in making marmalade. If such fruit is sold as "Dessert" grapefruit, the demand for the more sweetened and better-quality fruit harvested later in the season must be adversely affected. To comply with the condition "good edible quality and flavour" contained in the grading standards for "Dessert" grapefruit, the fruit must have become reasonably sweet. This stage of maturity is seldom attained earlier than July 15, and even at this date only a small percentage of the crop will be of dessert quality. In some localities the entire crop is fit for sale only as marmalade grapefruit up to about the end of July, and fruits situated in shaded portions of the tree will be even later before they become of good edible quality and flavour.

Regulation 18, 2 (b), reads as follows: "Prior to being packed in packages for sale, all fruit shall be graded in accordance with the grading standards hereinbefore prescribed for the particular kind of fruit in question." The packages must also be branded either "Marmalade Grapefruit" or "Dessert Grapefruit" together with the grade under which it is packed and the number of fruit in the case. The grower's registered number should be branded on the bottom left-hand corner of one end of the case and in the bottom right-hand corner of the same end the kind, variety, grade, and count should appear in that order. Any shipping marks should be branded in the centre. These particulars may be branded on both ends of the case if desired.

Feeding Her 25th Calf

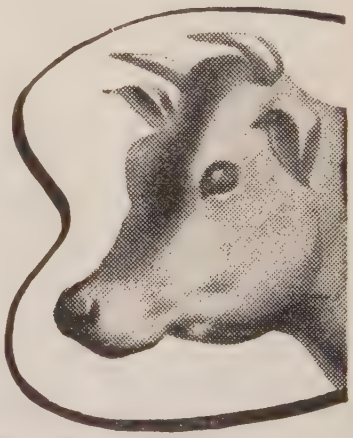
OUTSTANDING instances of longevity among farm animals are a common topic of conversation among farmers, but many cases are found to be exaggerated when investigated by an impartial observer, and often records to back up the assertions are lacking. William Houston, in his book "Breeds and Management of Cattle" refers to the Aberdeen Angus cow "Old Grannie" owned by Hugh Watson, of Keillor. She lived to be 35½ years old and had 25 calves.

Although not as old as "Old Grannie," "Barbara," a cow owned by Mr. Miller, of Hikimutu, near Taumarunui, is worthy of mention. She was born on October 4, 1916, to a brindle cow, her sire being a Shorthorn. She calved on October 16, 1918, and calved each succeeding year for the next 10 years. Mr. Miller then reduced his dairy herd and at the age of 12 Barbara was turned out with the run stock and mated each year with a Polled Angus bull. Barbara did not produce a calf each year, but when the accompanying photograph was taken in June, 1945, she was feeding her 25th, and doing it remarkably well considering she is treated the same as the other run cows and does not receive any supplementary feed.

Mr. Miller's country is typical of large areas of the King Country where the stock are generally particularly healthy.

—F. G. PRICE, Inspector of Stock, Taumarunui.

SAFEST—SUREST!



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SPRING SOWING OF CEREALS

By E. B. GLANVILLE, *Instructor in Agriculture, Auckland.*

THE time is now approaching when many farmers will be giving thought to the spring sowing of cereal crops for the production of grain.

With the present world shortage of food, New Zealand growers should endeavour to produce more grain and as far as possible make the Dominion self-supporting in this respect. This would make available to those countries where there are extreme food shortages the grain now being imported into New Zealand.

The sowing of spring-sown cereal crops, such as wheat and oats, takes place in August and early September. The sowing of barley is generally done a little later, usually in September or early October.

The seeding rate for spring-sown cereal crops requires to be a little heavier than when they are autumn-sown, and care should be taken with the selection of seed. This should be heavy, machine-dressed, have a high germination and purity test, and should be treated for smut before sowing.

OATS

If oats are grown on high-fertility soils, they become very rank and lodge badly, making harvesting difficult. Therefore, it is advisable to grow this crop on soils where the fertility is on the low side. Oats produce a good yield when sown after wheat, and because this crop does not demand high-fertility soil conditions it fits in admirably in the crop rotation on arable farms.

The need for shipping large quantities of oats and oaten chaff each year from the South Island to the North Island could largely be overcome if North Island farmers made an effort to produce at least their own chaff requirements. Oats can be grown and harvested quite satisfactorily in the North Island, and if North Island farmers increased the acreage of this crop, it would not only be to their own advantage, but would also prevent shortages which occur at times through lack of available shipping space.

Spring-sown oats in the South Island should be confined to the districts where the rainfall is higher, such as Otago and Southland.

In the North Island the Algerian variety is the only one that should be grown, but in the South Island both Algerian and Gartons Abundance can be grown, the Algerian variety being used for feed purposes, and Gartons Abundance for both feed and milling purposes. Gartons Abundance is a high-yielding variety, but cannot be grown successfully in the North Island on account of the prevalence of rust.

Spring-sown oats should be sown through every coulter of a grain drill at the rate of 3 bushels to the acre at a depth of about 2½in., and harrowing with tine harrows should follow the drilling. Phosphatic fertiliser should be used at the time of sowing at the rate allowed under the rationing regulations.

If possible, sowing should be done during August. Lighter yields are experienced when later sowings are carried out.

WHEAT

This cereal is generally sown where possible in the autumn, but in higher-rainfall districts where soil conditions are often too wet for autumn sowing, spring sowing is favoured. This is the practice in North Island wheat-growing districts and in parts of the South Island, particularly in the far south. If soil conditions are suitable, sowing should take place in August to obtain a reasonable yield. In the South Island spring sowing should be completed early in September, as later sowing tends to lighten the yield. In the North Island sowings can be made up to October with satisfactory yields, but to ensure reasonably good yields sowing is better done between August and mid-September. The principal varieties recommended are Tainui and Cross 7. Tainui is a very suitable variety for North Island conditions, especially where the land is light or where sowing is late, but where sowing can be done early and the soils are heavy with high fertility, the Cross 7 variety can be used to advantage.

The seed should be sown through every coulter of a grain drill at the rate of 2 bushels per acre at a depth of about 2½in., while the full amount of phosphatic fertiliser allowed under the rationing regulations for spring-sown wheat should be used. After drilling, the area should be harrowed with tine harrows.

BARLEY

Barley is a crop which is better suited to spring sowing, as it will not stand wet, cold conditions. Consequently, with the exception of districts where the soil is light and the climate dry, all sowings are carried out during the spring.

In the South Island all barley required for malting is grown in certain recognised districts, such as parts of Marlborough, Canterbury, and Otago where the rainfall is low and there are good harvesting conditions. Feed barley is needed in large quantities, mainly for feeding to pigs, and as the pig population is larger in the North Island, barley required for this purpose should be grown mainly in North Island districts. If this were done, tremendous saving in transport from the South Island would be made. The feed barley would also be cheaper to the pig fattener.

When growing barley for malting the recognised two-rowed malting varieties should be sown, but when it is grown for feed the Cape or Black Skinless variety should be used.

Barley should be sown through every coulter of a grain drill at the rate of 1½ bushels per acre in the South Island, and at 2 bushels per acre in the North Island. Where it is being sown for malting purposes great care should be taken to drill it in evenly, as this has an important bearing in obtaining even quality of grain. After drilling is completed the land should be tine harrowed. If it is found necessary to harrow the crop in the early stages to suppress weed growth, only very light harrows should be used, as the young barley plants are very delicate in the early stages of growth. Rolling with a Cambridge roller after the crop is well established is advantageous to growth.

Pre-cooling of Perishable Fruits

By A. A. POWELL, *Cool Storage Officer, Wellington.*

THE problem of maintaining perishable fruits in a good condition until they can be transported to distant markets has always been a source of concern to fruit growers. The successful marketing of these fruits is largely dependent on the efficient application and use of refrigeration, and a number of growers have found that wastage of fruit through over-ripeness can be reduced to a minimum by the use of pre-cooling chambers on their orchards.

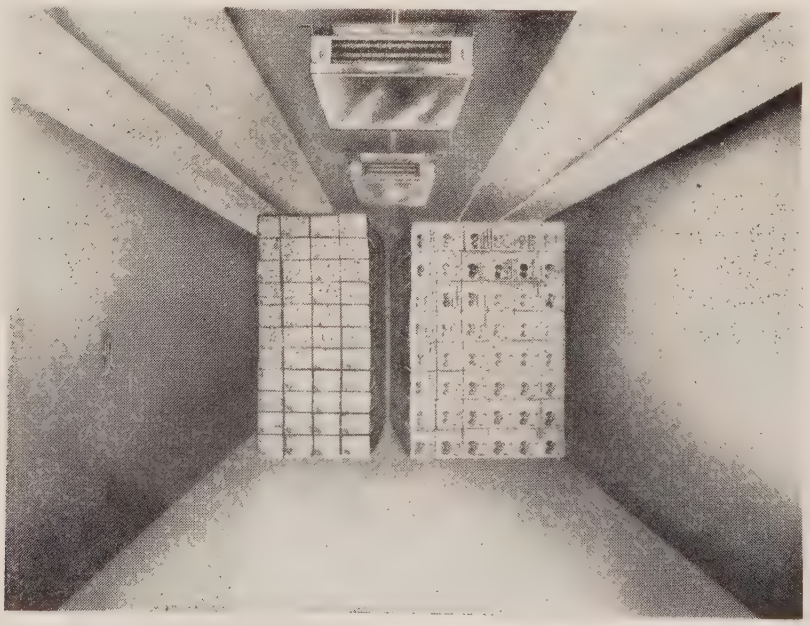
GROWERS' pre-cooling chambers vary in size according to the quantity of fruit to be stored, and range in capacity from the small private store of 250 bushel cases to the large co-operative store of 40,000 bushel cases. The total capacity of these pre-cooling stores in the Dominion at present is nearly 150,000 bushel cases.

Typical Pre-cooling Chamber

The interior of a typical pre-cooling chamber operated by a fruit grower is shown in the illustration. Erected by Mr. W. Hinton, Alexandra, Central Otago, this store has a fruit stacking capacity of about 900 bushel cases. Its interior dimensions are: Length, 20ft.; width, 12ft.; and height, 9ft. While this height gives satisfactory results, the distribution of air above the stacked fruit would be improved by increasing it to 10ft. The stone walls are 6in. thick and are insulated with two 2in. thicknesses of fibre-board thoroughly sealed with bitumen before and during fixing. To protect the insulating material from damage, the interior should be plastered with cement (3 to 1) with a little lime added for easy working. A ½in. coating, if well worked in, should be sufficient.

Easy Access to Fruit

The insulated chamber door, measuring 6ft. x 3ft. 6in., is fitted with a small door or port so that fruit can be moved in and out by gravity conveyor. From the door, which is placed in the centre of one end of the chamber, a central passage runs the full length of the chamber and gives easy access to the stacked fruit. Two ceiling-type evaporators, constructed of copper tubing with aluminium fins, are installed above the central passage. In the centre of each evaporator a ⅙-h.p. motor and a 14in. diameter air circulating fan are placed vertically.



Interior view of Mr. W. Hinton's pre-cooling chamber.

The refrigerating plant is powered by a 3-h.p. motor, and is fitted with an air-cooled condenser. The plant is completely automatic, and if reliable automatic control instruments are used, good storage conditions can be maintained with little attention.

Stacking

The fruit cases should be stacked on floor battens to enable the circulating air to remove the heat coming up from the floor insulation. Uninterrupted air spaces from the floor to ceiling should be provided between the stacks. There should be 1in. air spaces between the ends of the cases, and ½in. or finger room between the sides. Horizontal battens, 2in. x ½in., should be placed between the cases so that the air can circulate freely throughout the stacked fruit cases from the walls to the central passage. The stacked cases should be placed at least 3in. from the walls of the chamber in order to allow the air to be forced down behind the stacks.

When installing a refrigerating plant in a cool store, the three main considerations are:

1. **The maximum daily cooling load.**
2. **Temperature.**
3. **Relative humidity requirements of the produce to be stored.**

Accordingly, stone- and small-fruit growers who are contemplating building a pre-cooling chamber should seek the advice of the Cool Storage Officer, Horticulture Division, Department of Agriculture, P.O. Box 3004, Wellington, so that they will be able to install the most satisfactory plant and equipment to meet their particular needs.

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The Incidence of Poultry Diseases

A SURVEY of the incidence of poultry diseases in New Zealand, based on information collected during the past five years, is contained in this article by F. C. Bobby, Superintendent of Poultry Husbandry, Wellington. He also comments on control measures advocated by the Department of Agriculture.

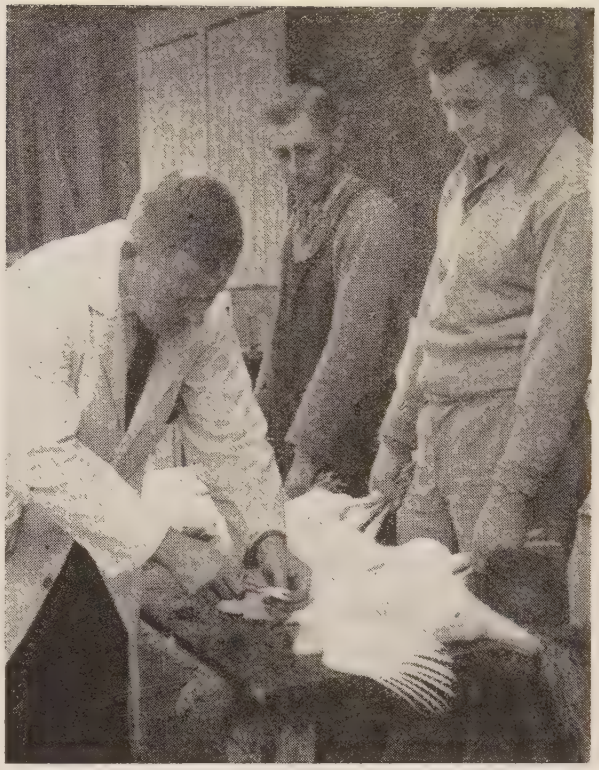
AS the incidence of disease and consequent mortality among poultry is unfortunately increasing in New Zealand, the subject is of immediate interest and importance to poultry producers. This interest is evident from the freedom with which the problem of disease is discussed and from the fact that the poultry industry, through the Dominion poultry conference in Palmerston North last February, asked for the publishing of details of the incidence of disease in the Dominion.

Though facts must be faced, there is no necessity for undue pessimism about the presence of disease among poultry flocks, but there is certainly no room for complacency. A continuous effort is essential to keep diseases of poultry under control. Farmers can do more to help themselves by applying sound principles of poultry management and breeding than any laboratory research worker, veterinary officer, or poultry instructor.

Basis of Records

For a complete picture of the losses caused by disease it would be necessary to record the mortality on all or at least a large number of poultry farms during a period of years. The gathering of such data presents many real difficulties, and this information is not available. On the other hand a number of poultry farmers make use of the facilities for the post-mortem examination of birds offered at the Animal Research Station, Wallaceville. Birds, alive and dead, are received from all parts of New Zealand, and a report is sent to the owner in every case. During the past five years careful records have been kept of all reports sent from Wallaceville. From this information it has become possible to assess the relative importance of poultry diseases known to New Zealand.

Fowl paralysis—this bird is unable to use the right leg. Note the folding-in of the toes.



Testing for pullorum—taking a blood sample.

In reading the table which follows it is essential to remember that the figures are based on the number of diseased birds examined at the laboratory and not on all birds received. Furthermore, in many cases no birds from flocks affected by outbreaks of disease are sent to the laboratory. While admitting the incompleteness of the records under discussion, it may still be claimed that the figures quoted are of value as indicating the trend during five years in the relative importance of the diseases. During this period birds with diseases other than those recorded in the table have been received, but the numbers were so small as to be unworthy of inclusion.

The figures given represent the percentage of incidence for each disease named. They represent **outbreaks** of disease and bear no relation to the **number** of birds forwarded to the laboratory.

	Per cent.
Pullorum disease	19.3
Leucosis	14.6
Fowl paralysis	13.3
Duodenal coccidiosis	11.9
Tuberculosis	8.4
Caecal coccidiosis	7.8
Round worms	7.5
Tumours	3.3
Fowl pox	3.2
Blackhead	2.9
Tapeworms	2.6
Toxic heart disease	2.1
Osteopetrosis (marble bone)	1.9
Pullet disease	1.2
Total	100.0

Pullorum Disease

During the past five years the Department of Agriculture has given considerable publicity to pullorum disease,

and a campaign for blood testing as a method of control has been steadily carried out. In the past chicks which probably died of pullorum disease have been too often assumed to have died as a result of chilling under the brooder. At the request of officers of the Department more chicks have been sent for post-mortem examination, and thus poultry farmers have learned of the true cause of death instead of guessing at it. In this way the real significance of pullorum disease in New Zealand has been realised.

Fortunately poultry farmers have now realised the value of blood testing breeding stocks as a means of controlling this disease, and where blood testing has been carried out—particularly where an outbreak of pullorum has occurred previously among chickens — farmers have benefited.

In 1941 fewer than 700 birds were tested; for 1945 the figure was 110,000. The percentage of reactors in 1941 was 23.3; in 1945 the figure was 9.08 per cent. By blood testing their breeding stock in 1945 poultry farmers have eliminated from their flocks about 10,000 birds infected with pullorum disease.

There can be little doubt that this disease will lose its present significance if poultry farmers continue to blood test their birds annually.

Leucosis or Big Liver Disease

Though widespread in the Dominion, leucosis does not usually cause heavy losses in a flock, but is responsible for a steady wastage on many farms. The incidence of this disease has remained fairly constant during the past five years. As yet no practical and direct method of control has been developed.

Fowl Paralysis

The remarks on leucosis are mainly applicable to fowl paralysis. This disease, however, appears to be increasing and is likely to be a serious problem to the poultry industry in the future. In addition to causing a steady wastage on many farms, several severe outbreaks have been observed and mortality among pullets has been severe. Knowledge of fowl paralysis is still somewhat limited and again no direct method of control has been evolved. The recording of leucosis and fowl paralysis as second and third in importance on the list is in line with reports from poultry instructors.

Duodenal Coccidiosis

There is no effective control for duodenal coccidiosis once it has broken out. The parasitic organisms which cause the disease are located in that part of the intestine known as the duodenum, and any known disinfectant or drug strong enough to destroy these organisms would also destroy the lining of the intestine. Bad outbreaks are frequently associated with some weakness in management, constitution of the stock, or poor conditions under which the birds are kept—damp floors and overcrowding.

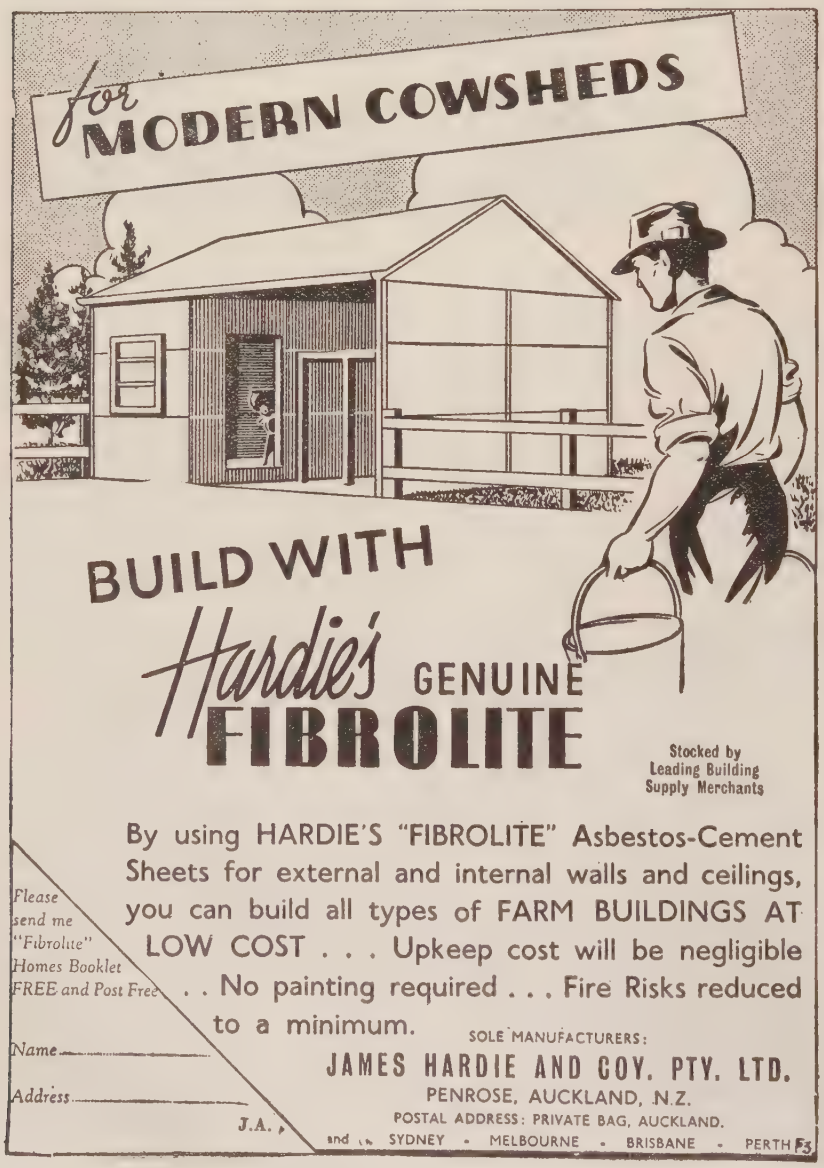
Tuberculosis

Tuberculosis is not generally regarded as a serious menace and its position on the list is probably higher than is warranted. It frequently causes heavy losses once it gets a grip on a flock, thus attracting attention and increasing the possibility that birds will be sent forward for examination. The tuberculin test is an effective method of control and there is no reason why this disease should become a problem. Arrangements can be made with the Department of Agriculture for this test to be conducted on any flock where it has been established that the disease exists.

Caecal Coccidiosis

Caecal coccidiosis is common among young chickens. Its incidence is greater than suggested by its position in the list, because affected birds are comparatively easily recognised. On being opened after death the caeca or blind guts are seen to be full of blood, and in pens of birds affected by coccidiosis blood is apparent in the droppings. Hence many outbreaks occur which it is not necessary for the owner to have confirmed by laboratory examination.

Many methods of control have been used in the past with varying degrees of success. Evidence is accumulating to suggest that sulpha-methazine is the most effective drug used so far.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Leucosis or big liver disease—comparison of a diseased liver (left) with a normal liver.

Fowl Pox

Fowl pox is reported principally from the North Island. The disease frequently causes loss of egg production, but only in severe outbreaks is mortality heavy. The Department has imported a pigeon pox vaccine from the United Kingdom for the control of fowl pox. The first reports of its use are satisfactory, and supplies of the vaccine are available at 8s. 6d. for 100 doses. Diphtheric roup is often associated with fowl pox, but more often occurs without the birds showing pox lesions. The vaccine available is **not** a cure or protection against diphtheric roup.

Round Worms and Tapeworms

Parasitic round worms are found in poultry throughout the Dominion, but they are not generally a serious menace at present. Many more cases of trouble from round worms occur than are indicated in the list of diseases quoted, because such infestations are easily diagnosed and frequently no birds are sent to the laboratory. Fortunately serious trouble from tapeworm infestations has not occurred. This type of parasitic worm is more difficult to control than the round worm. Though the use of nicotine sulphate is effective as a means of clearing birds of round worms, it has a drastic if temporary affect on the birds dosed. There is room for further research in the use of other vermifuges which are less drastic in action on the birds.

Toxic Heart Disease

Toxic heart disease is largely confined to a limited number of areas in the South Island. It has the peculiarity of being almost entirely seasonal. Up to the present no specific knowledge of its cause is available in New Zealand or apparently in any other poultry-producing country. Mortality is often heavy and death quite sudden, usually on the perch at night or when the affected bird takes sudden exercise or is excited, as at feeding time. Research into the cause of this disease is being undertaken by the Animal Research Station.

Pullet Disease

Pullet disease is another obscure complaint which caused considerable concern when it broke out among laying pullets in the North Island two seasons ago. A few outbreaks have been reported from both islands since, but fortunately there seems to be no evidence of its increase; rather the trouble has receded. It has been reported in the United States and Britain. Opinion in Britain is that it is associated with nutrition, but no definite knowledge of its cause has been reported.

Importance of Culling

This survey is in no way comprehensive. The necessity for culling all sick and weakly birds as soon as they are observed cannot be overemphasised, particularly when poultry foods are in such short supply.

An ailing bird may not be suffering from some infectious disease, but if it is—and the poultry farmer is not often in a position to judge correctly—that sick bird is a menace to every healthy bird in the pen. In their own interest, therefore, poultry farmers should maintain a strict culling programme throughout the year.

Dead or live birds may be sent to the Chief Diagnostic Officer, Animal Research Station, Wallaceville, for post-mortem examination, for which no charge is made.

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Vaccination Against Contagious Abortion

18,000 TREATMENTS IN 1943: 140,000 THIS SEASON

By E. H. STEPHENS, *M.R.C.V.S., Veterinarian, Department of Agriculture, Stratford.*

THE practice of vaccinating cows against contagious abortion is an old one, and when a live vaccine of the fully-virulent bacilli was used at the right time it protected a large proportion of animals from abortion caused by bacterial infection. Undesirable complications, however, caused the practice to be discontinued. The dead vaccine was shown by properly-controlled tests to confer no immunity; some owners thought their herds received benefit, but this apparent benefit could be attributed to factors other than the vaccination. The modern method of vaccination, however, is to use a special vaccine on calves, so that when maturity is reached an immunity against disease has become established.

IN the U.S.A. in about 1921 a weak strain of the baccilli, numbered 19, was isolated. When inoculated into test animals it was shown by blood test to be eliminated in a few months, as distinct from the fully-virulent bacilli, which persisted for years. After keeping this strain under observation for many years, calfhood vaccination was carried out with very satisfactory results.

Method of Vaccination

The usual method of vaccination is the subcutaneous injection in which 5 c.c. of the vaccine is put under the skin of the neck or behind the shoulder, where the skin is slack enough to accommodate a large volume of fluid without undue tension. The treatment is given at the age of four months and upward; in New Zealand, where seasonal milking is the rule, that means that the great bulk of vaccination has to be carried out in the first four or five months of the year.

Manufacture is complicated by the fact that the vaccine is a live one, with a life of only about a month even in cool storage. Thus vaccine cannot be made throughout the year and stored, but each batch has to be made, distributed, and used within a very short time. Hence the necessity for early application, so that the making and distribution for each area can be adjusted to the number of calves arriving at the vaccinating age at a given time. The vaccinating is done by the club veterinarians and departmental officers, who have their normal work to do as well. With the numbers to be vaccinated increasing every year, the co-operation of farmers will eliminate much waste of time.

The numbers of calves vaccinated since the inception of the scheme are as follows:—

Season	
1943	18,000
1944	43,000
1945	107,000
1946	140,000 approx.

Race Essential

On receipt of the vaccine in the field the work is arranged so that when the bulk of the calves in one area are within the vaccinating age they are all done on one day. There is, of course, the inevitable tidying up in cases where the calves are much later than average.

The provision of a race is essential. It should be wide enough for the average calf of six to eight months, but not so wide that the animal can turn round. It should be high enough to prevent a calf jumping over but not so high that the vaccinator cannot easily lean over to make the injection.

About 17in. inside width and 3ft. 6in. in height should suffice for the average Jersey-cross calf, but the race would need to be larger for such breeds as Friesians. If the sides are open, pieces of old corrugated iron on the outside of the race act as a baffle plate and are conducive to the comfort of the operators.

With such a race the vaccinator stands on one side and the assistant on the other. The calf's head is forced over the rump of the one in front and is easily held steady for the injection.

A race is not only useful for the annual contagious abortion vaccinating, but can be used for such work as blackleg inoculation in the blackleg areas, drenching, and tattooing. From the farmer's point of view it saves the use of much brawn; with a big mob of calves they seem to grow heavier as the work proceeds. From the vaccinator's viewpoint it saves much time and makes the handling of the vaccine safer. A temporary race in the cowshed is very pleasant, especially in wet weather, but unless the calves are accustomed to coming into the shed difficulty is often found in getting the mob under the roof.

In closely-settled areas the provision of a central yard on each road—as was done in the days of compulsory blackleg inoculation—and the concentration of all calves on the road at that point would enable much greater numbers to be vaccinated in a given time than can be done by farm-to-farm visits.

After-effects Slight

Immediate after-effects of vaccination are slight. Some calves are a little off colour for a few days. Occasionally large cold abscesses form at the site of inoculation, but if left alone they absorb, leaving a lump which also gradually decreases. When a vaccinated heifer slips the occurrence should be reported to the nearest Stock Inspector so that a blood sample can be taken to ascertain if the slip is the result of contagious abortion or other causes. These findings are recorded and enable the efficiency of the vaccination to be assessed.

Nature is not fond of 100 per cent.—she abhors it as she abhors a vacuum; but an efficiency of 80 to 90 per cent. in the protection of heifers against contagious abortion is a tremendous gain when it is remembered that many slip at five months and never come in milk at all. In addition to the loss of milk, the inflammation of the womb left after the abortion is a potent cause of permanent sterility. The results in heavily-infected herds in Taranaki have been most satisfactory so far.

SOIL EROSION

The future well-being of New Zealand is intimately dependent on fertile and productive topsoil. In the past mistakes in land practices have brought about severe losses of pasture land through erosion; the repetition of these mistakes must be avoided. Methods of soil conservation and erosion prevention are fully discussed in Bulletin No. 263, "Soil Erosion," which is now obtainable free from the Department of Agriculture at Auckland, Wellington, Christchurch, and Dunedin.

IN THE HOME GARDEN

Potatoes, from Seeding to Storage

This article is in response to a request for information on potato-growing in the home garden, from first preparations to harvesting and storage.

By D. K. PRITCHARD, *Instructor in Vegetable Culture, Wellington.*

FROM June onward, especially among home gardeners who usually grow all potatoes required in the household, preparations will be in train for growing the crop. If seed for next season's planting has been reserved from potatoes grown last season, it will not be necessary to buy supplies. Recommedations in these notes apply to seed, no matter how it has been obtained.

TO secure hardy, stocky shoots on seed potatoes, placing them in seedling boxes 2½ to 3in. deep is the ideal method. Deeper boxes may be used, but as the layers of tubers are increased the efficiency of the method decreases. In the shallow-box single-layer system the shoots will be vigorous, hardy, and coloured true to variety, but deeper boxes with a number of layers will invariably produce weak, spindly growths which are easily broken off in handling and suffer severely when planted early.

Put in a box, "rose" end up, the seed may be placed where there is plenty of light and fresh air but where frost will not injure the shoots.

Propagation by "Crowns"

In a recent issue of "Scientific Horticulture," the result of investigations by L. Gluscenko, Lenin Academy of Science, Russia, concerning the use of potato "crowns" for propagation, is stated as follows: "The general conclusion is that propagation by means of potato 'crowns' cut in autumn from large tubers and stored in earth is at least as successful as propagation by whole tubers. The conditions necessary for obtaining the requisite corky layer on the cut pieces are a temperature of approximately 60 to 65 degrees F., and adequate aeration and moisture during the first 10 to 15 days after cutting."

It is worthy of note that this method of propagation, adopted by Russia after the outbreak of war with Germany, saved for food large quantities of potatoes which would otherwise have been used as seed.

Soil

It is generally recognised that a medium-heavy, well-drained loam soil, amply supplied with organic matter, is most suitable for potato-growing.

Choice of Variety

Hard and fast recommendations about any particular variety of potato to plant are not advisable. Even when grown under exactly similar conditions, some varieties produce heavier crops than others. Whether an early, late, or main planting is to be made will be determined by the garden plan or economic necessity. If two crops are to be grown during the season, an early and a main crop variety will be chosen.

For a first early crop use Epicure or Arran Banner; for the early main crop, Arran Banner, or Aucklander Short Top; for the late main crop, Aucklander Short Top, Arran Chief, Dakota, or Inverness Favourite.

Certified Seed

Soil and preparations for planting may be all that is desirable, but seed is the basis of the crop. If the seed is of poor or indifferent quality a profitable return cannot be expected. It is important, therefore, that if seed has to be bought only the best obtainable should be used. Government Certified seed may cost a little extra, but experience justifies this additional expenditure. If Government Certified mother seed is planted, seed for the following season's planting should be selected from the resultant crop. Government Certified seed carries the responsible authority's guarantee of purity and freedom from diseases affecting yield and is therefore to be preferred.

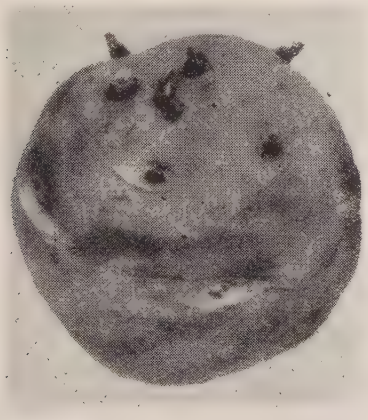
Land Preparation

That part of the garden which it is intended to use for the potato crop should be dug as early as convenient, thrown up in ridges, and "left in the rough." After being exposed to the weather during winter, the soil will be much more easily worked down to the condition necessary for planting and subsequent cultivation. When a green manure crop is grown on the area to be used for potatoes, it should be dug in at least six weeks before the seed is planted. Should weeds grow excessively during the fallowing period, a shallow digging will bury them, improve the tilth, and provide better aeration.

Because potato scab is stated to be induced in freshly-limed soil, the application of lime immediately before or after digging is not advisable. Before planting, the land should be made reasonably level.

Manuring and Planting

After levelling and raking the area over, lines should be drawn to mark where the rows are to be planted. For an early crop rows may be spaced 24in. apart. Because of the extra cultivation necessary and the heavier crop invariably produced, 30in. or even



Sprouts developing in ample light.

Sprouts developing in darkness.

Comparative yields: Two centre bags—from inferior seed. Two outside bags—from high-quality (Certified) seed.

more between rows for a main or late crop is necessary to provide soil coverage for the developing tubers as a protection against "greening" through exposure and the depredations of the potato tuber-moth.

Along the lines drawn, shallow furrows should be made with a hoe. In these furrows a fertiliser mixture of 3 parts by weight of superphosphate and 1 part of sulphate of ammonia should be applied at the rate of 6 to 8oz. to each 9ft. of row. To mix the fertiliser with the soil before planting, these furrows may be raked over and the lines drawn again in the same place. If furrows are opened up planting will be much easier.

The seed should be set 3 to 4in. deep. The time of planting will depend mainly on the climate in the district, and the incidence of frost should always be considered when making an early planting.

Cultivation

Growth of weeds and texture of soil will be the main factors to determine the frequency of cultivation. To ensure highest crop production, weeds should not be permitted to rob the plants of either moisture or plant food, and where the soil is heavy more frequent cultivation will be necessary.

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During prolonged periods of dry weather, moisture may be retained in the soil by regular shallow hoeing to create and maintain a soil mulch. Only in special circumstances can artificial watering of areas planted to potatoes be recommended.

When hoeing it is desirable that some of the soil between the rows be drawn toward the plants. Supported in this way during the early growing period, the crop is less likely to be affected by high winds; this work is termed "banking." It should be completed when, or just before, the top growth reaches the flowering stage. Moulding will protect maturing tubers, and for this purpose all available soil between the rows should be drawn up to the stems of the plants.

Preventing Disease

The most prevalent disease affecting potato crops is late blight. Through neglect to take preventive measures many home gardeners have substantial annual losses. Late blight is a fungoid disease, easily recognised by dark brown spots which usually make their first appearance on the leaves. These spots spread to the stems of the plants, ultimately destroying the haulm. Disastrous results follow when the tubers become affected.

For protecting potato crops, no more effective spray can be recommended than home-made Bordeaux mixture. Following is the formula given by the Plant Diseases Division, Department of Scientific and Industrial Research: "To prepare 4 gallons of Bordeaux mixture, dissolve 4oz. of bluestone with hot water in a glass jar (the solution will corrode metals). Mix 5oz. of hydrated or burnt lime with a small amount of water, and break down all lumps. Strain the lime through cheesecloth into a kerosene tin and wash through with water. With the tin about three-quarters filled, pour in the bluestone solution, stirring vigorously all the time. The Bordeaux is now ready to use and appears as a light blue precipitate. Washing soda may be used at 5oz. in place of lime, but where this mixture has to be combined with lead arsenate there is liable to be some foliage damage. None of the Bordeaux powders is as effective as home-made Bordeaux."

From experience it may be stated that a galvanised iron bucket, or a benzine tin which has been twice coated with boiling coal tar, can safely be used without damaging the tin or affecting the efficiency of Bordeaux as a spray mixture.

Complete coverage of plants with Bordeaux is the only way to give adequate protection against attacks of late blight.

The addition of arsenate of lead, as mentioned in the formula quoted, is necessary when chewing insects have to be controlled. For the control of late blight alone arsenate of lead is not necessary.

When the top growth is seriously affected with disease, cutting it off close to the ridge may be the best method of saving the crop from infection. The tubers can then be dug when convenient, but should not be allowed to remain long in the ground because of the danger of their starting into growth. This is likely to occur, particularly if the weather remains warm and the soil becomes saturated.

Dig Early in the Day

A fork, usually with five broad tines, is the best tool for digging potatoes in the garden. It should be inserted far enough from the ridge to clear the tubers, or a proportion of the crop may be badly forked, and rendered unfit for storage. During the early part of a sunny, windy day is the best time to dig potatoes in the home garden, and they should all be picked up and bagged before night. This is particularly important for potatoes which are to be stored. The potato tuber-moth lays its eggs on leaves and stems of the plant and also in the eyes of the tubers. When potatoes affected by potato moth are stored the results are disastrous. If this insect is present at digging time therefore, potatoes should be lifted from the ground and bagged as soon as possible after digging.

Storage

Cases, bins, clean sacks, or the floor of a shed are all suitable for potato storage. The atmosphere must be neither too dry nor overcharged with moisture. Unrestricted light will induce "greening," which will spoil the tubers for eating. Frost, too, will cause serious loss. Only undamaged specimens free from disease should be selected for storage. Periodical examination is essential so that diseased tubers can be removed before others are contaminated.

SUGAR BEET

By G. A. BLAKE, *Instructor in Agriculture, Hastings.*

AS there are no factories in New Zealand for the extraction of sugar from sugar beet roots, the crop is grown in this country almost solely as a winter supplement for pigs, nearly 98 per cent. of the total area being grown in the chief dairying districts of the North Island.

THE total acreage of sugar beet has progressively declined from a peak of 452 acres in 1939 to 202 acres for the 1942-43 season (the latest figures available), mainly due to a shortage of labour at this time and not from any failure of the crop to fulfil the objective for which it was grown. With a fuller realisation of the value of this crop, the area sown is now tending to increase, and a definite relationship exists between the area sown and the number of breeding sows kept. In 1939 breeding sows numbered 99,648, declining to 82,023 by 1943, but there are indications that sow numbers are also increasing again.

It is not generally recognised that sugar beet produces more actual food per acre than most other crops grown for the feeding of stock. A good crop of 30 tons per acre gives 10,000lb. of starch equivalent, equal to 6.1 tons of barley; a 60-ton crop of mangolds produces 9,100lb. of starch equivalent equal to 5.5 tons of barley; carrots at 40 tons per acre produce 7,850lb. of starch equivalent equal to 4.7 tons of barley, and artichokes at 10 tons per acre produce 3,670lb. of starch equivalent equal to 2 tons of barley.

The superiority of sugar beet as a food producer is thus clearly indicated, and the crop should occupy a more imporatnt place in the cropping schedule on all dairy farms where pigs are kept.

Preparation of Seed-bed

Sugar beet is a deep rooter and can be grown successfully wherever mangolds thrive. It prefers a deep, free-draining, fertile soil; heavy clay soils and peat areas are unsuitable. Districts of excessive rainfall and cold temperatures are to be avoided, as poor crops usually result.

The selected area should be skim-ploughed in the early winter, or the turf heavily disced, followed by a deep ploughing in July or August. In districts where the turf breaks down readily, deep ploughing without prior skimming or discing may be carried out in September and the crop sown about a month later. Where this procedure is followed preference should be given to an area on which the dairy cows were wintered so that the crop may benefit from the accumulation of animal droppings.

Sugar beet requires a fine, firm seed-bed and all cultivation after ploughing should be to this end. A final rolling immediately before sowing will help to provide the firmness and will bring moisture to the surface for good germination.

Where the first crop has been produced disease-free a second crop may be grown on the same area, but the deep ploughing should be omitted for this crop, owing to the likelihood of previously-buried weed seeds being brought to the surface where they will germinate and compete with the crop. Deep cultivation with either a fixed-tine or spring-tooth cultivator, followed by the discs, harrows, and roller, will usually provide a suitable seed-bed.

Place in Rotation

Like most other root crops, sugar beet does best after grass, but good crops can also be obtained when following swedes or chou moellier that have been fed off, or peas and red clover, on account of the nitrogen which they have added to the soil.

Successive crops may be grown on the same land where the natural fertility is high, or where heavy-yielding crops have previously been obtained.

Time of Sowing

The sugar content, varying from 14 to 20 per cent., is directly controlled by the type of soil, variety, climatic conditions, and earliness of sowing. Best results are generally obtained by sowing in October, preferably at the beginning of the month, when the land is usually moist from the winter rains and good growth is obtained before drier conditions prevail. Late sowings usually result in poor crops with a correspondingly lower sugar content and reduced feeding value.

Varieties

The importation of sugar beet seed from England has been restricted by shipping difficulties and only local seed is available, mainly from a variety known as "Kleinwanzleben." No guarantee can be given by the grower or merchant as to the correct name of the variety of seed, but work is at present being undertaken in the selection of improved types of roots, and seed from these should be available within a year or two.

LIFTED SUGAR BEET

Some years ago trials were carried out with eight different varieties to determine the most suitable one for sugar production, the following table showing the results obtained.

TONS PER ACRE (Average Yields).

Variety.	Yield of beets.	Yield of sucrose.	Sucrose. per cent.
Kleinwanzleben E ..	27.2	4.18	15.4
Kleinwanzleben N ..	23.1	3.71	16.1
Kleinwanzleben P ..	24.8	4.09	16.5
Johnson's Perfection	23 9	3.97	16.6
Schreiber	24.0	4.01	16.7
Marsters	24.0	3.71	15.5
Greenings	13.7	2.00	14 6
Strube	26.7	4.04	15.1

Higher yields of beets than the above have been grown in the North Island, one crop in which Greenings (a local selection) was used yielding 35.7 tons of roots and 6.63 tons of sucrose per acre.

In suitable localities farmers can save their own seed by planting out in October a few of the best roots from the previous crop. When the seed is ripe the whole plant is cut and allowed to dry out on a tarpaulin, when most of the seed will shake out. Cleaning is done by rubbing through a sieve large enough to allow the seeds to go through, any rubbish or stalks remaining in the sieve being discarded.

Rate of Seeding

The usual seeding rate is 4 to 5lb. of seed per acre, but where the seed-bed has been well prepared and ample moisture is present 3 to 4lb. per acre has proved satisfactory. The "seed" closely resembles that of mangolds but is slightly smaller. Each seed case contains from two to five seeds, most of which are capable of germination.

No seed treatment for disease or germination is necessary.

Method of Sowing

The seed may be sown with the combined ridger and sower or with the grain drill on the flat. Each system has advantages, but the latter is probably the more commonly used. The rows should be 18in. to 21in. apart to allow for intercultivation and the seed sown from ½in. to 1in. deep. Rolling after drilling is advisable.

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The home-made lifter.

This crop also transplants well in the North Island, especially in the Auckland and Taranaki districts, and for very small areas this method is satisfactory, leaving a longer period for the preparation of the ground and the killing of weed seedlings. Care must be taken, however, to see that the tap root is neither broken when lifting nor doubled up when planting. The transplants may be put in with a trowel or laid along a furrow slice and ploughed in, but with this latter method the earth is often insufficiently firmed against the roots and some plants die.

Manuring and Cultivation

A sweet soil is essential for a good sugar content, and from 5cwt. to 10cwt. of carbonate of lime should be applied after ploughing. The 3cwt. of superphosphate or 4cwt. of serpentine superphosphate per acre allowed under wartime rationing has proved satisfactory on naturally fertile land when sugar beet is the first crop after grass. The fertiliser should be sown with the seed. When conditions allow 3cwt. superphosphate, 3cwt. blood and bone, and 1cwt. of sulphate of ammonia per acre is recommended. In those districts where potash gives a response on pasture or mangolds 1cwt. of 30 per cent. potash should be added to the mixture.

On dairy farms where liquid manuring is carried out one application before ploughing, followed by another application after germination, together with the artificial manure applied at sowing time, gives the best results. On a trial carried out on the Stratford Demonstration Farm the above system proved better than any other. When only the solid portion of animal manure is used it should be spread over the area to be cropped before ploughing. Sugar beet requires fertile conditions and is an excellent crop to grow in worn-out pig runs or other areas that have received a heavy concentration of animal manure.

Hand weeding or hoeing soon after germination is necessary for weed control, and at the same time plants should be thinned to about 9in. apart. Horse hoeing or mechanical intercultivation should be carried out between the rows, but the meeting of the vigorous-growing tops soon renders further intercultivation unnecessary, even in wet seasons when weed growth is prolific.

Small areas well cared for are better than larger areas given little attention.

Unlike mangolds sugar beet can be fed with perfect safety during all stages of growth, and storing for increased digestibility is unnecessary. The roots may be left in the ground and dug as required, but if grown for use during October and November they should be lifted in July, after the tops have died down, and stored in heaps in a dry place, covered with straw or hay to exclude light to prevent new growths from the crowns.

Sugar beet is usually grown in small areas, and so far has not warranted the manufacture of special machinery for harvesting. Crops are usually lifted with a digging fork or spade, while a deep furrow is sometimes ploughed alongside a row and the roots pulled over by hand.

Tractor-drawn potato diggers set as deep as possible have been used successfully for lifting sugar beet, but in most cases the tips of the roots are broken off. A home-made lifter which obviates this fault may be made by attaching a shovel-shaped blade to the beam of a single-furrow plough in place of the mouldboard and share (see illustration), the plate being 18in. wide, 15in. deep, and sharpened on the front edges. Drawn by a small tractor with a man holding the handles of the lifter, this implement effectively lifts the beet and leaves them ready for carting off.

Sugar beet is not attacked by insects. Mottled heart and crown rot are sometimes found in the roots, but occurrence of these diseases is usually not sufficient to warrant any other treatment than selecting a new area for each year's crop.

Utilisation

Although primarily grown for feeding pigs during the winter and early spring when dairy by-products are in short supply, sugar beet provides a food supply from March to September or October. Having only a small stomach capacity, pigs are unable to

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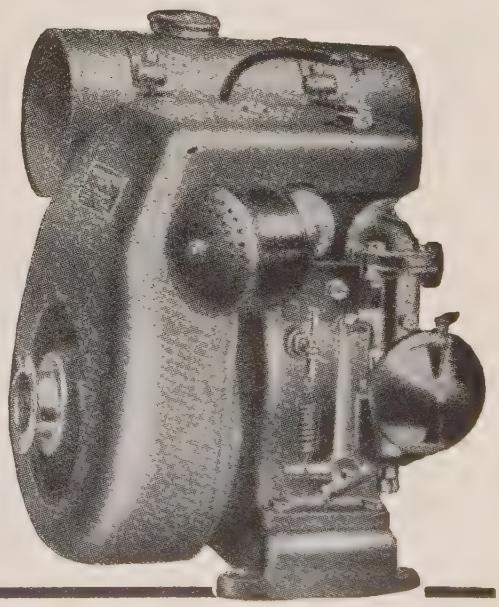

assimilate sufficient of the more bulky foods to obtain an adequate ration, but the high dry matter content of sugar beet overcomes this difficulty. Analysis of commonly-grown pig foods in the following table shows that sugar beet contains considerably more actual food than the other crops. An animal has to eat almost double the quantity of both mangolds and pumpkins to obtain the same nutriment as from sugar beet. The high value of the leaves allows their profitable utilisation during the early autumn, when they can be fed to sows and litters as the milk supply dwindles.

For feeding to poultry the beets should be split lengthways and stuck on nails on the wall of the fowlhouse, about 18in. from the floor, where the fowls can pick at the roots without fouling by tramping or wet weather.

Sugar beet can be fed to dairy cows in the same way as mangolds, but are not usually grown specially for this type of stock, which can efficiently use the more bulky roots. Stall-fed cattle for winter milk supply, however, produce better on sugar beet than on mangolds.

ANALYSIS OF SUGAR BEET COMPARED WITH SOME OTHER ROOT CROPS.

Crop.	Water. per cent.	Ash. per cent.	Protein. per cent.	Carbohydrates. per cent.	Fat. per cent.	Dry Matter. per cent.
Sugar beet leaves ..	88.4	1.8	1.9	7.6	.3	11.6
Sugar beet roots ..	83.6	1.1	1.2	12.6	.1	16.4
Carrots	88.3	1.2	1.2	9.1	.2	11.7
Pumpkins	91.7	.9	1.4	5.5	.5	8.3
Mangolds	90.6	1.0	1.4	6.9	.1	9.4

Small areas of sugar beet have been grown for feeding sheep, when the crop is made to serve a double purpose. During the autumn store lambs are allowed to graze the tops, and fatten equally as well as when fed on rape; later the roots are lifted and fed out on grass to mature sheep. This method of utilisation is not generally adopted, and is more suited to those localities where club root or insect pests prevent the growing of cruciferous crops.

Sugar beet is grown almost exclusively for pigs and can be fed, at any stage of growth, to animals of any age from suckers to breeding stock. During April and May the tops form the bulk of the crop, and the sugar content of the roots is also high. Feeding out usually commences about this time; a portion of the crop is fed to sows and litters to supplement the dwindling milk supply, thus introducing weaners to this food before weaning. After weaning, sugar beet forms the main portion of the ration, supplemented by milk and meat-meal. When the milk supply ceases, sugar beet to capacity **plus ½lb. meat-meal per day** will profitably winter these stores and allow them to make daily gains in weight of up to one pound.

Where the area is suitably fenced and warm, draught-proof accommodation provided, stores may be grazed on the crop, when no harvesting or feeding out is necessary. Meat-meal, however, should be supplied to the grazing animals to secure the best results. This method may appear wasteful, but the saving in labour somewhat compensates for this.

For ideal utilisation sugar beet should be fed to the pigs on grass. Some farmers have adopted the method of cropping part of a paddock, and feeding out on the balance of the field, which is made pig proof. Each year the cropped portion is regrassed and a new area broken up for the crop. Temporary sleeping quarters for the winter are provided and should be substantial enough to serve until the whole of the field has been cropped. By this method the pigs have an area of young grass each year, and the fertility of the balance of the field is increased by having the crop fed on it, and this in turn assists in the production of the following crop.

This type of utilisation has enabled large numbers of store pigs to be wintered and even fattened with a minimum of losses, and at the same time allows some rejuvenation of the pasture in the permanent pig runs. This factor alone warrants the provision of a winter supply of roots, grown and utilised on another portion of the farm, well worth while.

Sugar Beet for Feed

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Repairing Damaged Fences

By J. R. MURRAY,
Instructor in Agriculture, Hamilton.

NOTHING is more unsightly on a farm than a broken and neglected fence, but its dilapidated appearance is not the most serious aspect. Fencing in disrepair represents deterioration of an expensive asset, a mounting and inevitable repair bill as the neglect continues, and probably a financial loss through damage to crops by stock. An astonishing amount of time is wasted on rush repair jobs on fences that have already been patched up, and rounding up stock that break through afterward; on the other hand timely attention to fences will be amply repaid and create a sense of pride in the farm.

Loose wires and battens wrongly stapled on. Note how the stock have pushed the battens along and at the same time loosened the wires in an attempt to get at the abundant feed through the fence.

REPAIRING fences on any farm must be given thought and planning. Consider the farm fencing as a whole: What fence is in the wrong place or needs renewing? How much good material can be saved from such a fence to repair others? Fencing material is at a premium today, so is any fence unnecessary or can it be better placed to conserve precious material? Perhaps there is a fence which needs rebuilding with entirely new material. In some cases it is better to dismantle a fence completely and re-erect it. To use inferior material in a new fence is most unwise; before long it will be in a state of disrepair.

A neglected fence like this is absolutely no protection for plantations and is a danger to stock.

Rotting Posts

Posts that are starting to rot at ground level can be painted with creosote if enough good timber remains after cutting off the rotten portion. Rot fungus can penetrate well into the wood, and only a penetrating preservative will kill it; ordinary tar only puts a skin on the surface. No bark should be left on before creosoting, as it prevents the preservative from being absorbed.

Loose Wires

Loose wires are often tightened up with a hammer handle or stick by making a loop and twisting it. This practice weakens the wire, and more often than not the wire breaks at the first attempt of an animal to push its way through. Any such method—and there are many—gives only a temporary result. If a wire strainer is

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available it should be used. Barbed wires should be unstapled first and restapled after straining. Staples must not be driven home on to the wires on all posts but only on the battens.

Battens

It is essential to repair fences before they are neglected too long and before more damage is done. If only a batten or two is broken or dislodged, stock can make the wires loose and push the battens out of place. This happens more often when stapling has been done wrongly. Alternating the angle of placement over alternate wires will prevent battens from being dislodged or pushed along the wires. Staples on battens should be driven hard on the wires.

Posts Are Not Good Strainers

An ordinary fencing post in place of the usual type of strainer is not a sound proposition. A good solid strainer, properly stayed, will never lift and is always the foundation for any type of fence. A well-stayed, stout post may be suitable as a strainer for temporary fences, but how often is a temporary fence anchored to a post in another fence with a post as a stay? Before long the post is lifting or the fence is pulled out of line. Eventually a strainer must be put in, which means loss of time and perhaps in the meantime damage to crops.

A fence in an extreme state of disrepair. The most economical proposition is a new fence.

Holes Under Fences

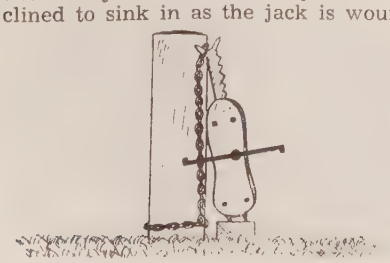
Nearly always there are odd places where small stock have pushed under a fence and the ground requires filling in. On ditch banks and uneven ground this is common. Often a valuable post is used to block the hole, and there it lies to rot. A small amount of filling would give more satisfactory results.

How To Pull Up A Fence Post

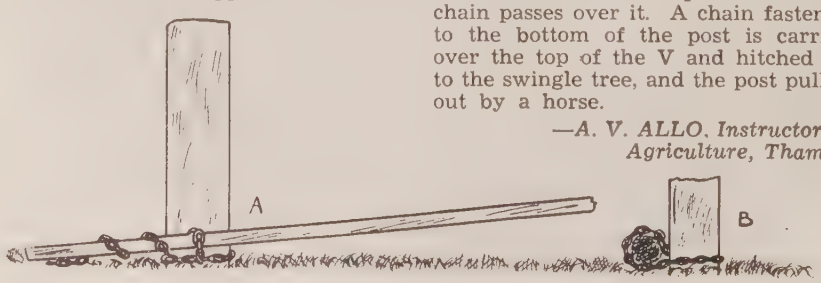
THESE simple methods of pulling out fence posts cheaply and quickly are particularly useful if a line of posts has to be pulled out.

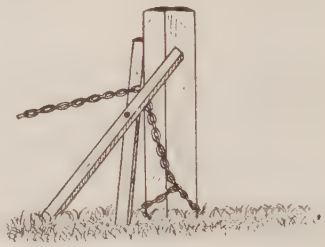
The main essentials are a timber jack and a stout chain, with a strong hook at one end.

The chain is looped round the foot of the post, and the loop is closed with the hook. The remainder of the chain is then lifted and, when taut, one of the links is laid in the lug of the jack, which is held erect and as close to the post as possible. The jack, which must touch the post where the chain engages it, is then wound up and the post comes up with the chain. It is important that the chain be kept taut and that the jack be as near upright as possible. When the ground is wet and sticky the foot of the jack is inclined to sink in as the jack is wound up. This sinking can be avoided by resting the butt of the jack on another post or on a length of 4in. by 3in. timber.



On all but the stickiest and tightest country the following method of pulling a post will usually prove successful. Take a strong pole about 12-14ft. long (white manuka is suitable) and fasten a chain round the foot of the fence post and then to the pole about two feet from one end, leaving no slack chain between the pole and the post. By pulling up the far end of the pole the post may be lifted, although it usually pays to loosen the soil around the post before attempting to draw it. The chain must be taken round the lever from the outside so that the first loop can be gripped between the lever and the post. If the process is reversed the lever will simply turn in the operator's hands and will not exert any lift at all. Example "B" explains.





A third simple method useful on light country is to make a V of two pieces of 4in. by 3in. timber about 3ft. long, which are bolted together. The crossed timber should reach between second and third wires from the top of post on the same place as the stay and should touch the post where the chain passes over it. A chain fastened to the bottom of the post is carried over the top of the V and hitched on to the swingle tree, and the post pulled out by a horse.

—A. V. ALLO, Instructor in Agriculture, Thames.

DRAINS

Open, Covered, and Mole

By P. S. SYME, *Instructor in Agriculture, Warkworth.*

THERE is probably no farmer in New Zealand who has not seen the benefits of efficient drainage, and there must be few farms which do not offer some scope for drainage improvements.

Though money judiciously spent on draining has proved a gilt-edged investment to many farmers, it must be admitted that some, to their sorrow, have rashly embarked on expensive development projects without first counting the cost. Before a sod is turned the farmer should carefully balance the estimated cost of drainage against the expected improvement in production. Since the margin of profit may sometimes be narrow, the work should be carefully planned to avoid costly blunders.

IN farm practice three systems of draining are commonly employed—open drains, covered drains, and mole drains. Though it is sometimes expedient to employ a combination of all three methods, mole draining is often impracticable because of uneven terrain, unsuitable soil, or obstructions such as timber or stones.

Open Drains

The initial cost of open drains is lower than that of covered drains, but upkeep charges are higher. They are inconvenient where implements are used, they occupy useful ground, and they are frequently a danger to stock. In peaty or swampy soils, however, no other system of drainage is practicable, and if the volume of water is large tile drains are too costly. On heavy clay land open drains are more effective than tile drains in collecting run-off surface water. Where comparatively level ground is constantly kept wet by surface water from adjacent hills, the water should be collected and led off by an open drain before any attempt is made to put in covered drains on the flat.

In digging an open drain care should be taken to allow ample width to prevent undue erosion of the sides, and to see that the sides are given sufficient batter. Too steep a grade should be avoided as it causes rapid wearing of the banks.

Underground Drains

Because of the heavy expense involved in underground drainage, very careful consideration should be given to ensure that the utmost efficiency is obtained. Where the land is valuable. a system of "thorough" draining may be justified. In this method, a system of drains on the "grid" or "herringbone" principle may be arranged so that the whole of the wet area is served by a series of minor and sub-main drains, which lead into a covered main drain, or into an open drain on the boundary of the field. This method is highly effective, but because of the heavy cost it is justified only on valuable land.

Under present-day conditions it is doubtful whether the old system of "thorough" draining is warranted on ordinary farming land, and the tendency is to adopt the "random" layout, in which the drains are merely laid where each is calculated to do the most good with the least cost.

Even though a whole field may at times lie very wet and appear to require complete draining over the whole area, a careful examination will often show that much of this water is seepage from only a few sources. A relatively small number of quite short drains strategically placed may quickly produce an amazing improvement over the whole field. In such circumstances the benefits are out of all proportion to the expenditure.

Depth and Distance

Where underground draining is adopted, experience has shown that there is in general a close relationship between the depths of the drains and the distances from which they will draw—the deeper the drains the greater may be their distance apart. However the effective depth of the drains depends very largely on the texture of the soil and whether there is an impervious pan near the surface which will prevent the water from passing freely to the drains. Special care is necessary on stiff clay soils, as effective drainage on this class of land is likely to prove both costly and difficult.

For "thorough" drainage the effective depth of the drains varies from about 2½ft. on heavy clay land to about 4ft. on light soil, the main drain being

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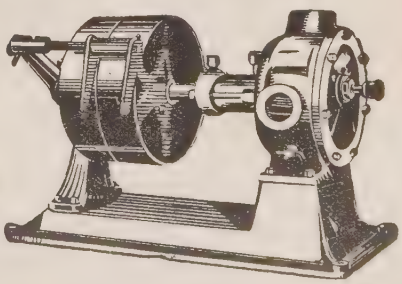

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about 6in. deeper. The distance apart may range from 20ft. on stiff clay soils to about 60ft. on light soils. Under New Zealand conditions, on the grounds of expense, one chain is commonly adopted as a standard distance apart, but this may be excessive and will not provide effective drainage during the wet winter months on the heavier types of soil.

Forethought Important

Before starting operations, careful thought should be given to the system to be followed and the location of the drains, keeping constantly in mind the importance of securing a good discharge point. When digging the drains, much time and labour are frequently wasted by making the trench unnecessarily large. Though the size must depend to some extent on the nature of the soil, it will usually suffice if the trench is started 12 to 14in. wide at the top, narrowing to about the width of the tile at the bottom. For this work a proper draining spade and scoop are almost indispensable and will quickly repay their cost.

The drainer should begin at the outlet and work back up the slope so that the water escapes as digging proceeds.

When the trench has been completed the bottom should be evenly graded before the tiles are laid, and this work should be regarded as of special importance. The carrying power of water depends on its speed, so that slowing of its velocity at any point of the drain must result in the depositing of soil particles which may ultimately silt up the tiles. Every endeavour should be made to secure an even gradient.

DRAINING TOOLS

A proper draining spade and a scoop are very useful tools. Note how the scoop is used for grading the bottom of the trench, and the size of the timber used in pole-draining the field.

If the land is wet at the time of draining, the water will provide an excellent guide if it is made to bank up by restricting the outlet.

Laying the Tiles

The laying of the tiles is a very important operation and should be done with great care. Work should start from the outlet and each tile should be fitted firmly in position, turning it if necessary so that the top edges of the tiles meet. The joints should be covered with inverted turves before filling in the trench.

If hollows are encountered where the trench has been dug too deep, it is better to dig round the edge of the trench so that the tiles will rest on firm ground rather than to attempt to fill in the hollows, as this will ultimately result in the tiles becoming displaced. If a soft patch is encountered the tiles should be carried over it on boards, or they are very likely to sink.

HIGH mineral content

Every bag of Summit Mineral Stock Food that leaves the Summit factory is guaranteed to contain Pure Bone Flour, Flowers of Sulphur, Cobalt, Salt, Limonite, Meal, Molasses, Sulphate of Iron, Calcium, Potassium of Iodide, Phosphates, Charcoal, Sulphate of Magnesia, and other constituents.

LOW feeding cost

The cost of feeding Dairy Cows Summit is definitely LOW. The cost per cow per week is less than 1¼d. and the following gives you the cost of feeding Summit to a whole herd:

20 cows .. £5 14s. 0d. per annum per herd.
50 cows .. £14 5s. 0d. " " " "
100 cows .. £28 10s. 0d. " " " "

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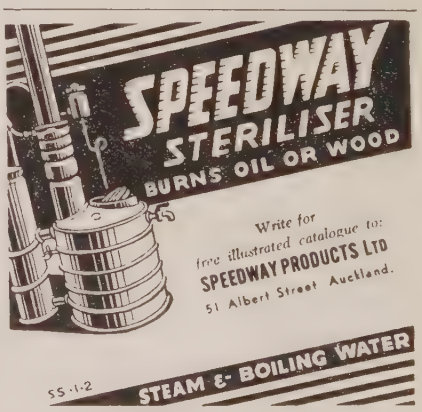
Agents and Stockists throughout the North Island.

Summit Mineral Stock Food Co. Ltd., 517 Main St., Palmerston North.



Correct Fall

The working of the drains and their effective life depend largely on correct fall, which should be sufficient to allow the drain to work to full capacity without scouring. Under normal conditions, a fall of from 2 to 6in. for 100ft. is satisfactory. Abrupt changes in direction should be avoided, and where a minor enters a main drain it should be curved in the direction of the flow at an angle of about 40 degrees.

The size of the tiles depends on the texture of the soil and on the area tapped by the drains. For minor drains 2½in. tiles are commonly used, but experience shows that there is less risk of displacement or silting up if 3in. tiles are employed. A long drain may be started with 2½in. tiles, changing to 3in. tiles for the lower portion. A 4in. main will serve 4 acres of light soil or about 5 acres of heavy soil. A 6in. tile will cope with 6 to 8 acres, and an 8in. main with about 18 acres. The size of the pipes used in the main may be progressively increased to correspond with the acreage drained. Since the main drain is usually led to the nearest convenient outlet, it is often possible to dispense with large-sized tiles.

Though it is generally agreed that tile draining can be exceedingly efficient, the high cost of the tiles tends to limit their use. If good manuka is available it can often be used as a fairly efficient substitute. Carefully laid, pole drains often prove highly effective and have a long working life. Provided plenty of good manuka is available, its use in preference to tiles may be economically justified. Where land is being developed from manuka sufficient good scrub should be reserved to cope with expected drainage requirements.

TYPES OF DRAINING

Random draining: A few drains laid in the right place can lead to a surprising improvement over quite a large area.

Outlet of a pole drain. Note how the manuka is laid in the narrow bottom of the trench.

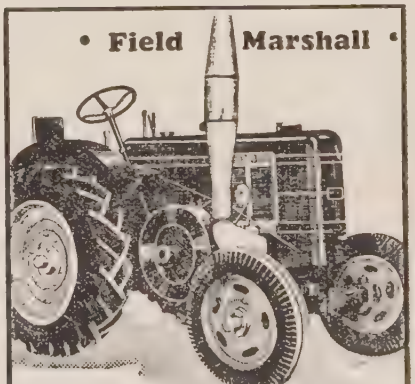
PLOUGHS AND PLOUGHING

PLOUGHS have been designed to work under a wide variety of soil and topographical conditions as well as to produce differing mechanical effects in their passage through the soil. The result has been to produce a very wide range of types, each particularly adapted for a certain kind of work, or for special conditions of soil, or for the power available for traction.

Apart, however, from differences in design, certain basic features are common to most ploughs, and the general principles of operation are the same.

This subject is fully discussed in bulletin No. 185, which is obtainable *free* from the Department of Agriculture, at Auckland, Wellington, Christchurch, Dunedin or Invercargill.

• Field Marshall •



South Island Farmers

Write for full details of the All British Field Marshall Mark 1, Full Diesel Tractor 20/28 h.p.

NATIONAL MORTGAGE & AGENCY CO. OF N.Z. LTD.
(Incorporated in England)
Christchurch, Ashburton, Timaru, Waimate, Oamaru, Dunedin, Gore, Invercargill.

Pedigree Sow Records

OF the 10 litters recorded during the three months January-March, 1946, 9 were sufficiently good to be included in one of the five grades set out below:—

Grade	Litter Weight. At 3 weeks.	At 8 weeks.
1	120 lb.	360 lb.
2	100 "	300 "
3	90 "	270 "
4	80 "	240 "
5	70 "	210 "

Contributed by the Livestock Division.

Breed Averages for the Period Under Review

Breed.	No. of Litters Recorded	Litter Weight at 3 weeks. (lb.)	Litter Weight at 8 weeks. (lb.)	Number of Pigs. Born.	Number of Pigs. Weaned.	Average Weight at 3 weeks. (lb.)	Average Weight at 8 weeks. (lb.)
Berkshire ..	4	108	287.3	8.5	7.5	14.4	38.31
Tamworth ..	3	74.7	235	8	6.7	11.15	35.07
Large White .	3	93.7	310	11.7	8	11.71	38.75

In connection with the grading of litters, a No. 3 grade is looked on as a good performance, No. 2 as excellent, and No. 1 as special.

THE following lists give the names and addresses of the owners, the herd book numbers of the boars and sows, together with the adjusted litter weights at three and eight weeks, the grade of the litter, and the number of pigs born and weaned.

Owner's Name and Address.	Herd Book No. of— Sire.	Herd Book No. of— Dam.	Litter Weight at 3 weeks. (lb.)	Litter Weight at 8 weeks (lb.)	No. of Pigs. Born	No. of Pigs. Weaned	Grade of Litter
Berkshire							
Rotomanu Pig Club (Secretary, H. E. Hodgkinson, Rotomanu, Westland)	18450	19461	130	289	11	9	3
S. Unwin, Stonycroft, Winchester, Sth. Canterbury ..	19666	19996	113	278	9	8	3
G. T. Cowan, Rotomanu, West Coast	18295	12798	105	321	7	7	2
T. E. Rowlands, Ruthen R.D., Kaiapoi	6113	19994	84	261	7	6	4
Tamworth							
G. Manship, Hari Hari, Westland	13754	12918	63	180	5	5	—
Hari Hari Pig Club (Custodian, G. Manship, Hari Hari)	13754	11634	78	255	8	7	5
Hari Hari Pig Club (Custodian, G. Manship, Hari Hari)	13754	13728	83	270	11	8	4
Large White							
J. H. Pitman, Rotomanu, West Coast	6116	6210	92	289	10	8	3
J. H. Pitman, Rotomanu, West Coast	6116	6002	110	355	11	8	2
T. E. Rowlands, Ruthen R.D., Kaiapoi	6113	5855	79	286	14	8	5

Cow's Stomach Trouble

Mr. B.F.W., Waimate:—

Would you please advise me how to treat a cow with "clue bind" or failure to chew the cud; what drench to use and how to detect the trouble. I have lost a valuable Shorthorn cow in this way. She was too far gone to do anything with when discovered. She was very fat, a gross feeder, and inclined to go away among scrub, eating dry matter. A large amount of half-digested food was found in her stomach and a quantity of fleshy string matter like strips of catgut. The paunch or first stomach was congested and hard. This is a very healthy district and it is rare to have trouble of any kind.

LIVESTOCK DIVISION:—

This is really a case of impaction of the rumen or first stomach, and is not an uncommon complaint in cows getting too much feed of a dry or fibrous nature. This condition can often be detected by kneading the flank on the left side, when the paunch will be found to be hard or doughy. For treatment food of a dry or fibrous nature should be of course discontinued, and a drench of Epsom salts 1lb. with 1lb. of molasses and a quart of water may be given. It is advisable to have the bowels working freely, but this does not always mean that the impaction in the paunch has been cleared.

Having given a purgative, one of the following powders should be given in water as a drench twice daily for three days. Ammonium carbonate 3oz., nux vomica 1½oz., gentian 6oz., ginger 6oz.; divide into six powders. In severe cases it may be necessary to have a veterinary surgeon operate on the cow and remove the contents of the paunch through the flank.

Sheep Dip Supplies

FROM the trend of inquiries received by the Department of Agriculture, it seems that many farmers are under the impression that considerable stocks of old sheep dip are still held in New Zealand and will be sold to farmers in due course.

These ideas are entirely erroneous, for it can be stated emphatically that the proprietors have already withdrawn all old stocks, which on account of the war did not contain derris.

This action allowed the new stocks, which once again contain derris or a similar quick-acting insecticide, to reach the farmer as quickly as possible. In future, there will still be a small quantity of the standard dips available for the benefit of a few farmers who definitely prefer this type; but all the derris-containing dips will bear an indication to this effect, and/or that they are of the "quick-acting" type.

How to Use Paints and Varnishes

This article is taken from a recent radio talk given by Mr. M. D. Harvey, Palmerston North, in the Wellington council's Y.F.C. session broadcast from Station 2ZA, Palmerston North.

PAINT is a combination of a pigment, such as lead or zinc oxide, and a drying oil, generally linseed. Colours are obtained by the addition of vegetable or mineral agents such as yellow ochre, umber, or vegetable black. In countries such as New Zealand the drying process or oxidisation is quickened by the addition of terebine or patent driers. Turpentines, both mineral and vegetable, are also used as thinners.

By a thorough grinding through the paint mills and a blending of ingredients, each manufacturer evolves his paint. Years of exposure tests are carried out on the paint film. The older type of mill consists of three pairs of heavy granite rollers, each revolving at twice the speed of the set above. By also moving laterally, the rollers squeeze and grind the ingredients until they emerge as a velvety paste. Extra oil is added until the paint is of a consistency to apply. The ball mill, a more modern type, is a large steel drum containing hundreds of small pebbles and revolving on a shaft. After the ingredients are put in, this machine requires practically no attention until the paint is ready. This process is usual in the production of an oil-base house paint. Other agents such as titanium or barium sulphate may be added as extenders or to make the paint more opaque. The procedure is varied for paints for special purposes like traffic marking, dairy factories, and heat resisting.

Roof paints are blended with a high-grade boiled oil in preference to raw linseed. A paint for ironwork is usually of different composition from one for wood.

Painting Problems

The most common painting problems are blistering, chalking, and cracking. Blistering is caused by sap or moisture in the timber. The heat of the sun draws it against the paint film until it forms a pocket and finally bursts. The best answer is to use dry and seasoned timber, particularly totara and matai. A priming paint will help, but that will not dry on wet or greasy wood. For such a surface a coat of shellac knotting should be used. When blisters have occurred it is necessary to clean the broken surface and apply a coat of the shellac knotting or aluminium paint before priming.

Chalking is the result of oxidisation—the oil content dries out and leaves the pigment. This can be tested by rubbing the hand on the painted surface, when the dry powder will rub off. This condition is preferable to cracking, and can be remedied by the application of oil, though that is not often done.

Cracking is a different problem, and is more common with zinc paints and can be caused by a very hard paint surface (such as a varnish or zinc paint) being used over one that has not a zinc base. A paint must breathe, and if the surface is so hard that it cannot expand and contract with variations of temperature the surface must break. Repainting then often necessitates burning off.

Two don'ts.—Don't paint in damp or frosty weather, and don't apply a good paint over a broken or bad surface without cleaning off.

Methods of Application

Painting is more than just brushing on paint from a tin. Paint manufacturers and master painters have evolved paints and methods of application for each type of job. Old paintwork should be free from all cracked, blistered, or flaked paint, which should be burnt off or removed with a paint remover. Good paint will not hide a rough broken surface. Burnt-off work should be primed again. Undercoats should dry in two to four hours less than a finishing coat. Build up from the quicker-drying underneath to the slower-drying on the surface. This gives a surface of more elasticity. The drying, of course, is governed by the atmospheric conditions.

For interior work a paint or enamel of a hard glossy finish can be used. There is little direct sun to contend with, but in a kitchen or bathroom steam or cooking vapour can damage the film. The enamel film, being hard and glossy, can shed the damp and stand up to continual washing. Enamels have not the body or covering power of an oil paint, and therefore a good deal depends on the undercoat. A good full-bodied flat paint, near the colour of the finishing coat, will give satisfaction provided the work is done on a good clean surface. Old or perished work should be sandpapered down and washed with painter's sugar soap.

Varnishes are of two types—cold varnish or long oil vanish made by boiling. In the first category are white spirit, knotting, paper and french polish. They are made by a straight mixing process of methylated spirits and shellac base. They will not stand water and, except for french polish and paper varnish, are mostly used as undercoats. The long oil and more elastic varnishes are made by boiling blended oils with selected gums. At one time kauri gum was used extensively, but it has been displaced by overseas products. Under this heading are spar, carriage, and general purpose varnishes, which will withstand water and hard wear. Hard oak, which is used extensively in the home, is made similarly. Except for general purpose varnish, each varnish has its own particular use.

Y.F.C.'s OWN PAPER

THE printing of Young Farmers' Club notes in a separate publication from the "Journal" was decided on at the last meeting of the Dominion Executive Committee of the Young Farmers' Clubs Federation.

This is the last issue of the "Journal" in which Y.F.C. notes will appear, and from July inclusive news of Y.F.C. activities will be embodied in an eight-page monthly supplement to the "Journal." This will be delivered to Y.F.C. members inserted in the "Journal" to which their membership will still entitle them at an annual subscription of 1/-.

Subscriptions to the New Zealand Journal of Agriculture may be paid at any office of the Department of Agriculture or direct to the Publisher, Box 3004, Wellington.

Taumarunui District Field Day

THE Taumarunui Agricultural and Pastoral Association recently sponsored a successful field day for the three local clubs—Kaitieki, Taumarunui, and Ohura. The field day took the form of demonstrations on various breeds of livestock.

Mr. W. Lindsay, president of the A. and P. Association, introduced three leading judges from Waikato, who had been invited to give the demonstrations—Messrs. T. Johnstone,

of Waitetuna (Romney sheep), D. Morrison, of Tauwhare (Aberdeen Angus cattle), and J. Pattison, of Kihikihi (Jersey and dairy-type cattle).

Mr. Johnstone in demonstrating Romney rams dealt with the breed from both a meat and a wool-producing view. He indicated that a square-shaped body with good heavy bone was needed. Fine-boned sheep were inclined to run to fat. The wool should be uniform throughout. A fleece which varied, say, from 52's on the shoulder to 46's on the hindquarters was not suitable. In buying rams it was important to handle the wool and see that it "opened up" well and did not have too many cross fibres or kemps. A ram with black patches on the skin was undesirable, as there was a possibility of his progeny being black.

Mr. Morrison demonstrated with an Aberdeen Angus heifer. He emphasised the difference between the Black Poll and the dairy breeds, and referred to the importance of docility as indicated by the eye; quiet cattle tend to fatten more easily. To breed an even line of stock was a decided advantage.

Mr. Pattison demonstrated the points of Jersey cows by the use of a judging chart, and pointed out the various defects in the cattle on hand, describing clearly the method of picking the ideal Jersey. He demonstrated dairy type with a pen of four Red Poll cattle, and illustrated his points by using a Y.F.C. judging card, indicating the proper manner in which the card should be filled in.

After each demonstration numerous questions were answered, and many interesting points were brought out. At the conclusion a picnic lunch was served under the trees, and a number of speeches were made, the speakers including Messrs. W. Lindsay (president A. and P. Association), D. Wapp (Taumarunui Y.F.C.), J. Dougherty (Ohura Y.F.C.), D. McFadyen (Kaitieki Y.F.C.), and R. Mear (High School). Thanks were expressed to Messrs. Johnstone, Morrison, and Pattison for their able demonstrations, to Messrs. E. Thurston, McKinnon, and D. Wapp for the loan of stock, and to Mr. C. Miles for the use of his stock and property.

—N. H. STREET, hon. secretary,
Taumarunui Y.F.C.

Wairoa Field Day

THE Wairoa Y.F.C., assisted by the newly-revived Nuhaka club, held a very interesting field day recently on Mr. Humphrey Bayley's property at Tahaenui. The weather was favourable and more than 80 members attended. Demonstrations were given as follows:—

"Setting and handling of a plough": Mr. G. Newlands, of Awamoti Station.

"Ailments and first aid in stock": Mr. A. D. M. G. Laing, Government veterinarian; among other subjects Mr. Laing dealt with facial eczema and temporary sterility.

"Establishment and maintenance of pastures": Mr. A. M. Lee, Department of Agriculture.

"Pruning and planting of fruit trees": Mr. B. Teague, florist and nurseryman.

"Killing and dressing of a sheep and a dairy cow": Mr. J. Ryan, of Swifts (N.Z.) Ltd. The cow was given by Mr. F. Shaw.

"Breed type and points of a dairy cow": Mr. F. Shaw.

"Dressing of a sheepskin": Mr. T. Glenny.

"Romney sheep": Mr. W. L. Torbett.

The sheep weight-guessing was won by P. Brombie and W. L. Torbett, equal, their estimate being ½lb. more than the true weight of 1771b.

Lunch was provided by Mr. and Mrs. Bayley in the grounds of the homestead. At the conclusion of the field day the Wairoa club chairman thanked demonstrators for their services and Mr. and Mrs. Bayley for their hospitality.

Reports on Club Activities

WESTERN SOUTHLAND

Otautau.—Business meeting. Reports on annual district meeting. Circular about drought problems discussed and full support to be given to proposals. Members will assist with the local winter and summer shows. District bay competition fully discussed. Twelve members present out of 22.

Seaward Downs.—Annual meeting. Officers elected: Advisory president, Mr. J. McKenzie, sen.; chairman, C. Sellars; secretary and treasurer, H. D. Martyn. Attendance of 14. Circular on drought problems discussed, attention being drawn to the seriousness of the position in parts of the North Island. Mr. K. Hargest, Western Southland Y.F.C. district chairman, gave some useful advice on the proposed interclub debating contest, and referred to the arrangements for the annual general meeting of the federation to be held in Invercargill, and the educational course to be held shortly. The interclub debating contest was fully discussed, and a challenge issued to Tokanui Y.F.C. A practice debate will be held on the subject "That Young Women should be Eligible to join the Y.F.C." Teams selected were: Wylie, Sellars, Marshall, and McCorkindale (negative); Rule, Maxwell, Howden, and Martyn (affirmative). Mr. Beck, a schoolmaster, will coach the teams and judge the contest.

Tokanui.—Annual meeting. Officers elected: Advisory president, Mr. W. Young; chairman, T. Ruddenklau; secretary and treasurer, C. D. Hurle. Attendance of 12.

EASTERN SOUTHLAND

Five Rivers.—Annual meeting. Officers elected: Advisory president, Mr. A. G. Muir; chairman, P. Drummond; secretary and treasurer, R. W. Muir. Twelve members present.

SOUTH OTAGO

Clinton.—Annual meeting. Officers elected: Advisory president, Mr. R. Pannett; chairman, H. Bell; secretary and treasurer, J. A. Steel. Eleven members present.

Milton.—Address by J. McCallum on "Farming in Italy." Twelve members present out of 17.

Te Houka.—Annual meeting. Officers elected: Advisory president, Mr. L. Barclay; chairman, B. Helthrop; secretary and treasurer, K. Botting. Arrangements were made for table tennis. Ten members present out of 19.

Warepa.—An address by Mr. D. F. Miller on "Electricity" was of particular interest because the district will shortly be served by electric power. Attendance of 11.

DUNEDIN

Dunback.—Annual meeting. Officers elected: Advisory president, Mr. E. McLew; chairman, E. C. Stanley; secretary and treasurer, C. N. Frater. In the absence of the speaker at a subsequent meeting an interesting discussion took place on the working of a paddock from turnips to sowing down in permanent pasture. There was a full attendance of 10 members at each meeting.

Palmerston.—Annual meeting. Officers elected: Advisory president, Mr. T. Sheat; chairman, J. Wilde; acting-secretary, J. C. Nimmo. Attendance of 15 members out of 29.

West Taieri.—Annual meeting. Officers elected: Advisory president, Mr. D. Grant; chairman, A. L. Robertson; secretary and treasurer, A. M. Reid. Twelve members present.

NORTH OTAGO

Enfield.—North Taranaki district's invitation to a party of Otago-Southland members to visit Taranaki clubs was discussed. Members will be billeted with local club members. Smoke concert discussed. Address by Mr. J. B. Chapman on "Service on Public Bodies." Eighteen members present out of 25.

Five Forks.—Annual meeting. Officers elected: Advisory president, Mr. A. C. Johnston; chairman, F. J. Simpson; secretary and treasurer, C. R. Kingan. A roll of honour board was discussed. Members will act as assistant stewards at the North Otago A. and P. Association show. A letter will be sent to Mr. M. Austin thanking him for his services to the club. Attendance of 21 members out of 23.

SOUTH CANTERBURY

Pleasant Point.—Annual meeting. Officers elected: Chairman, E. L. Esler; secretary, F. J. Wylie; treasurer, P. A. Agnew; advisory members, Messrs. D. B. Gardiner and W. Skinner. Twenty members present.

Willowbridge-Studholme.—A newly-formed club. Officers elected: Chairman, I. Grant; secretary, H. Rollinson; treasurer, S. Meyer. Fourteen were present at the initial meeting. At a subsequent meeting Mr. J. Barclay was elected advisory president and an entertainment committee was appointed. A form of "Brains Trust" was conducted by Mr. J. Foley, in which 52 questions were asked, mainly on farming subjects; this proved very successful. Twelve members present.

MID-CANTERBURY

Chertsey.—A newly-formed club. Officers elected: Advisory president, Mr. W. H. Wilkinson; chairman, A. Wilkinson; secretary, J. Copland; treasurer, P. Williams. The initial attendance was 15, together with seven primary-school boys.

Reports On Club Activities

Hinds.—Annual meeting. Officers elected: Advisory president, Mr. H. L. Chisnall; chairman, J. R. Cocks; vice-chairman, K. McConnell; secretary, L. N. Chisnall; treasurer, A. McKenzie; auditor, Mr. T. P. Lowe. Several new members attended.

Lauriston.—A newly-formed club. Officers elected: Advisory president, Mr. C. Hilgendorf; chairman, S. Leatham; secretary, G. W. Hayward; treasurer, F. Clements. Twelve present at the initial meeting.

Wakanui.—Annual meeting. Officers elected: Advisory president, Mr. A. Amos; chairman, H. L. Hyland; vice-chairman, B. Hyland; secretary, S. Watson; treasurer, R. Amos; advisory members, Messrs. J. E. Moore and C. Crawford.

CHRISTCHURCH

Christchurch Technical College.—A newly-formed club. Officers elected: Advisory president, Mr. C. E. Iversen; chairman, A. Rolston; vice-chairman, P. Leech; secretary, F. Redpath; assistant secretary, T. Stone; treasurer, S. H. Chatterton; assistant treasurer, G. Cox. Attendance of 68 at the initial meeting.

Ellesmere.—Annual meeting. Officers elected: Advisory president, Mr. G. W. P. Osborne; chairman, A. C. Lambie; secretary, E. H. Overton; treasurer, C. Abbott. Attendance of 26 members. A field day was held at Winchmore Model Farm, when Mr. McKeelar, a local farmer, gave a talk and demonstration on "Irrigation"; 31 members of the Ellesmere club and 40 visitors from neighbouring clubs attended. At a later meeting three returned members were welcomed and a farewell accorded Mr. Barker, who is leaving the district. Arrangements were made for the annual ball. A lantern lecture was given by Dr. I. D. M. Blair, of Lincoln College, on "Some Features of North Island Farming." Thirty members present out of 59.

NORTH CANTERBURY

Cheviot.—Annual meeting. Officers elected: Advisory president, Mr. R. S. Harrison; chairman, H. M. Cooper; secretary and treasurer, R. M. Stevenson. Arrangements were made for future meetings and field days and the circular about drought problems was discussed. A short talk was given by Mr. E. C. Withell, district Y.F.C. secretary. Attendance of 20 members out of 40.

Scargill-Omihi.—Annual meeting. Officers elected: Chairman, H. Symonds; secretary and treasurer, G. G. Gardner; advisory members, Messrs. W. H. Brown, H. Loe, and J. Sloss. Messrs. E. G. Smith and E. C. Withell (district Y.F.C. secretary), both of the Department of Agriculture, were present. Attendance of 18 out of 45.

West Eyreton.—A newly-formed club. Officers elected: Advisory president, Mr. S. Bower; chairman, B. I. D. Rolls; secretary and treasurer, L. R. Thompson. Mr. E. C. Withell, the district Y.F.C. secretary, was present at the meeting, the attendance at which was 12. At a later meeting Mr. E. G. Smith, assisted by Mr. J. P. Beggs (both of the Department of Agriculture), gave a lantern lecture on "Subterranean Clover" to a full attendance of 14 members.

MARLBOROUGH

Flaxbourne.—Annual meeting. Officers elected: Advisory president, Mr. W. S. Morrin; chairman, E. T. Rudd; vice-chairman, R. Forsyth. The election of a secretary was left over till next meeting. Two new members were enrolled. Attendance of nine members out of 18.

Seddon.—Annual meeting. Officers elected: Advisory president, Mr. W. J. Kennington; chairman, K. Dysart; vice-chairman, R. Fleming; secretary and treasurer, P. Marfell; club reporter, J. Hammond. Three new members were enrolled. Arrangements were made for dog trials and a special committee appointed. Attendance of 16 members.

NELSON

Moutere.—Annual meeting. Officers elected: Advisory president, Mr. R. Teece; chairman, T. Teece; secretary and treasurer, R. H. Eggers. Twelve members present.

Tapawera.—Annual meeting. Officers elected: Advisory president, Mr. F. A. Eden; chairman, M. Savage; secretary and treasurer, B. F. Hodgkinson. The minutes of the district committee meeting were read for members' information. A remit was passed proposing that a representative of the Nelson Boys' and Girls' Agricultural Clubs be invited to attend future district meetings. Support was offered to the Tapawera club in the running of its proposed dog trials. A vote of thanks was accorded Miss Hodgkinson for auditing the club's accounts. Attendance of seven members out of 14.

Waimea North.—A newly-formed club. Officers elected: Advisory president, Mr. H. Griffin; chairman, B. W. Russ; secretary and treasurer, D. G. Heslop; advisory members, Messrs. W. H. Heslop and M. Harford. The district secretary, Mr. D. M. Merry, of the Department of Agriculture, showed a film entitled "New Zealand's Scenic Wonders." At a subsequent meeting Mr. Merry gave a lantern lecture on "The Importance of Good Pastures in Pastoral Farming." It was arranged that all members present should speak for a few minutes at the next meeting. Full attendance of 15 members.

WESTLAND

Kokatahi-Koiterangi.—A field day was held on the properties of Messrs. L. Duncan (Koiterangi) and J. Monk (Kokatahi). Demonstrations were given by Dr. Burns, Mr. Stevens, and Mr. Bevin, all of Lincoln College, on "Soils and Manures," "Dairy Stock," and "Pastures" respectively. Thirteen members and 17 local farmers and others interested attended.

HOROWHENUA

Levin.—Annual meeting. Officers elected: Advisory president, Mr. H. J. Lancaster; chairman, M. Rolstone; secretary and treasurer, S. Gimblett. The attendance was 31. At a subsequent meeting four new members were enrolled. Arrangements were made for a field day at Massey College and a committee of five appointed to arrange for radio talks. A ball will be held. Three-minute talks will be given by members at the next meeting. Mr. G. S. Robinson, of Massey College, spoke about his visit to England. Attendance of 28 members out of 43.

Otaki-Te Horo.—Address by Mr. F. Wilton on beekeeping. Fifteen members present out of 20.

MANAWATU

Bunnythorpe.—The minutes of the annual meeting of the district committee were discussed. Four members will attend the educational week at Palmerston North. Teams will be entered for the seven-a-side football and tug-of-war at the educational week, and several club members will compete in field events. A practice debate will be held at the next meeting in preparation for the interclub contest for the Vile's Shield. G. McKenzie and A. Dittmer, members recently returned from overseas, gave interesting addresses on their experiences. Attendance of 15 members out of 23 (one absent with J-Force).

Colyton.—The minutes of the recent district annual meeting were discussed. Entry forms for the educational week at Palmerston North were distributed. Arrangements were made for club football and a dance, and ways of raising funds discussed. A list of speakers will be prepared and submitted to the district secretary. Mr. R. J. Shortall, an ex-member of the club, spoke on "Living and Farming Conditions in Italy." Seventeen members present out of 24. Officers elected at the annual meeting: Advisory president, Mr. W. H. Hocker; chairman, T. S. Manson; secretary, K. M. L. Porter; treasurer, R. J. Salmond; advisory members, Messrs. J. Vealleans and C. Burr. Invitations to the annual ball of the Oroua Downs Y.F.C. and Waituna West Y.F.C. sports day were received.

Feilding.—Annual meeting. Officers elected: Advisory president, Mr. A. C. Buist; chairman, I. D. Colquhoun; secretary and treasurer, F. J. Mills. Attendance of 22 members.

Halcombe.—Annual meeting. Officers elected: Advisory president, Mr. G. Buchanan; chairman, I. H. Old; secretary, K. Cowdrey; treasurer, M. J. Ferguson; club reporter, T. Wishnowsky. Twenty-five members present.

Kairanga.—Twelve members will attend the educational week at Palmerston North and teams will be entered in seven-a-side football and tug-of-war. The club programme was reviewed. A number of field days will be held during the year, including a visit to Massey College, a stock-judging day, and a sports meeting. Impromptu speeches will be given at each meeting by three speakers to be selected by ballot, choosing own subjects. Mr. A. Williams, of the Kairanga Dairy Company, introduced members to the technique of tug-of-war. Attendance of 27 out of 37. A sports meeting was held later in the month, events including seven-a-side football, a relay race, and 100yd. sprint. A relay team was selected consisting of S. Callensen, O. Mitchell, T. Kearins, and M. Fleming.

Kimbolton-Kiwitea.—Annual meeting. Officers elected: Advisory president, Mr. D. Watt; chairman, A. Shapleski; secretary, W. Foreman; treasurer, G. Craine. Eighteen members present.

Oroua Downs.—Arrangements were made for a field day. Two members will attend the educational week at Palmerston North, and teams and competitors were selected to take part in sports events. B. Veale was nominated to give a radio talk on "Pampas Grass" in the Y.F.C. session from 2ZA, Palmerston North. An interesting display of films was shown by Mr. A. V. Lithgow, Department of Agriculture. Full attendance of 24 members, together with 12 visitors.

Rangiotu.—Final arrangements were made for the club show. Two seven-a-side football teams will be entered at the educational week at Palmerston North; the coach is M. Donaldson and the selectors G. Millard and M. Griffin; practices will be held. The treasurer, D. Robertson, retired. Twenty-three members present out of 25. Officers elected at the annual meeting: Advisory president, Mr. F. Bond; chairman, R. Andrew; secretary, I. B. Te Rangi; treasurer, V. Alve.

Rangiwahia.—A field day was held on the property of Mr. Miller, who spoke on the handling of dogs. He then ran a huntaway, while Mr. Goodwin gave criticisms. Mr. Goodwin then ran a heading dog while Mr. Miller gave the criticisms. One of the club members also ran a dog. Attendance of 26.

Rongotea.—A sports committee was appointed to arrange seven-a-side and tug-of-war teams, and other entries for the sports events at the Palmerston North educational week. Mr. A. V. Lithgow, secretary of the Wellington Y.F.C. Council, gave details of the suggested survey in each district aimed at forming new clubs and recruiting members. Two ex-servicemen club members gave talks. F. Luxford spoke on New Caledonia, giving details of mining and other industries, illustrated by maps. M.

Kairanga Club's relay race team, winners of Y.F.C. Challenge Shield at Oroua Downs Y.F.C. sports meeting. From left: S. Callensen, O. Mitchell, T. Kearins, and M. Fleming.

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Cocker's subject was "Concrete Fencing Posts," including details of construction and useful hints about manufacture. Twenty-three members present out of 44. The sports committee met after the meeting to arrange practices.

Te Arakura.—Entries were sought for a club sports meeting and final arrangements made for a field day. The Palmerston North educational week was discussed. Talks were given by members on "Correct Growth of Cattle" (S. Avery) and "Planting of Fruit Trees" (J. W. R. Stewart). Mr. C. J. Hamblyn, Fields Superintendent, Department of Agriculture, Palmerston North, lectured on "Farm Drainage." Attendance of 16 members out of 18. Twelve members visited the Feilding freezing works, where a demonstration and talk on "The Causes of Sterility" were given by Mr. G. H. Jarrett, Supervising Meat Inspector.

Waituna West.—A report on a meeting of the district committee was received. Arrangements were made for participation in sports at the Palmerston North educational week. A dance will be held. A talk prepared by J. Shannon and D. Meads to be broadcast in Y.F.C. radio session from 2ZA, Palmerston North, was read by Shannon. Twenty-two members present out of 27.

Whakarongo.—The annual parents and friends evening was combined with a welcome home to returned servicemen in the district. I. Tabor reported on the forthcoming Y.F.C. educational week and sports meeting at Palmerston North. The club chairman, D. Robertson, congratulated Tabor on his election as chairman of the Manawatu district committee. Arrangements were made for the annual club ball. A field day will be held on Mr. S. Oxenham's property. Tabor reported on the recent annual meeting of the Manawatu district committee. Mr. G. Dawick, secretary of the N.Z. Jersey Cattle Breeders' Association, showed a selection of films on behalf of the Palmerston North Cine Club. Twenty-two members were present out of 29; the total attendance of 61 included 13 ex-servicemen and 26 other visitors.

WANGANUI

Bulls.—Annual meeting. Officers elected: Advisory president, Mr. D. Pennington; chairman, F. Jurgens; secretary and treasurer, T. G. Thoms. Prospective members and unfinancial members will be approached. Mr. A. V. Lithgow, secretary of the Wellington council, gave details of the forthcoming educational week at Palmerston North. Three members signified their intention to attend. A dinner for ex-servicemen and an annual dance will be held. The club library was discussed. A talk on the Y.F.C. movement was given by Mr. S. Freeman, Dominion organising secretary. Sixteen members present.

Hunterville.—Annual meeting. Officers elected: Advisory president, Mr. C. T. Chisholm; chairman, P. Rhodes; secretary, J. D. Lilburn; treasurer, M. Henwood; Press reporter, K. G. Morrison. A trophy given by Mr. C. J. Craig for member attending the most meetings was won by M. Henwood. R. Pickford and P. Rhodes will prepare and deliver talks in the Y.F.C. radio session from 2ZA, Palmerston North. Twenty-four members present.

Mangaweka.—Annual meeting. Officers elected: Advisory president, Mr. G. McDermid; chairman, A. Reilly; secretary and treasurer, J. K. Dalrymple. The Palmerston North educational week will be supported. The proposed club radio talk from 2ZA was discussed, and the subject selected was "Pioneering Days in Mangaweka." A dance and fortnightly euchre evenings will be arranged in support of the Y.F.C. National Memorial Fund. A visit to Imlay Freezing Works, Wanganui, while killing is in progress was arranged. Ten members present.

Marton.—Annual meeting. Officers elected: Advisory president, Mr. H. G. Stewart; chairman, A. L. Vile; vice-chairman, W. B. Gray; secretary, M. F. Gray; assistant secretary, D. R. McFarlane; treasurer, K. H. Smith. The roll of honour board and broadcasts from 2ZA, Palmerston North, were discussed. Delegates were appointed to attend a meeting of the Hunterville Sports Club. Club stationery will be printed. W. B. Gray was appointed club librarian. A debate with Hunterville Junior W.D.F.U. will be arranged if possible. The advisory president appealed for more junior members. Sixteen members present. At a later meeting arrangements were made for a club dinner and the annual dance. There was further discussion on the educational week, for which a seven-a-side football team will be entered. A field day to be held on Mr. K. McK. Duncan's property will include breaking-in and castrating a horse, working sheepdogs, and a post-mortem. K. Coles spoke about new clubs in the Wanganui district and appealed for a larger membership in the club; he said there were many young men in the district who should join. Members were urged to ascertain what activities were not catered for so that adjustments could be made to the club programme. Attendance of 21 members out of 27.

SOUTH TARANAKI

Hawera.—The club recently resumed activities after being five years in recess. Officers elected: Chairman, R. Corder; secretary, R. S. Heise; treasurer, Q. Hicks. An advisory president will be appointed later. The meeting was convened by Mr. J. Johnson, who spoke on the working and activities of the club before the war. The district Y.F.C. secretary, Mr. J. E. Davies, also addressed the meeting. Attendance of 14.

NORTH TARANAKI

Inglewood.—The chairman, J. V. McIntyre, spoke on a motion dealing with land settlement carried at the recent district committee meeting. Six new members were enrolled. A radio talk will be prepared for the Y.F.C. radio session from 2ZA Palmerston North. The advisory president, Mr. F. S. Burson, gave an address on "The Conduct of a Meeting." Twenty-three members present out of 27.

Karawaka.—Annual meeting. Officers elected: Advisory president, Mr. C. B. Lepper; chairman, D. Hall; secretary, S. McCaul. Fifteen members present. At a later meeting arrangements were made for the preparation of radio talks, and members were addressed by Mr. C. A. Burgess, Department of Agriculture, on crops most suitable to the district. Attendance of 13 out of 15.

Mangorei.—Annual meeting. Officers elected: Advisory president, Mr. H. West; chairman, O. Balsom; secretary and treasurer, W. Johnston. Nine members present.

Rahotu.—Annual meeting. Officers elected: Advisory president, Mr. A. Gilhooly; chairman, J. W. Waswo; secretary, N. J. Hopkins; treasurer, G. Campbell. Eleven members present. A field day was held at the Waitara freezing works, members being conducted over the works by the staff in charge of departments. Attendance 17.

Taraki.—A newly-formed club. Officers elected: Advisory president, Mr. H. M. Taylor; chairman, G. Long; secretary, W. Shepherd; treasurer, B. Quigley. Attendance of 25 members.

Toko.—Five new members were enrolled. A supper committee was appointed. The Palmerston North educational week was discussed. Mr. T. T. Murray spoke on "Land Valuation." Twenty-seven members present out of total of 35. A field day was held at the Waitara freezing works, members travelling more than 30 miles by bus. The visitors were shown over the works by members of the staff and watched with interest the killing of pigs, sheep and cattle. The party numbered 24, including five prospective members.

WAIRARAPA

Alfredton.—Arrangements were made for the annual dance. The combining of funds collected for men returned from overseas service was discussed. A field day will be held in Masterton. The Palmerston North educational week was discussed. Mr. W. V. Hadfield, Department of Agriculture, lectured on "Seeds and Certification." Attendance of six members out of 20. Officers elected at the annual meeting: Advisory president, Mr. J. L. Heckler; chairman, J. Hill; secretary and treasurer, D. A. Napier. Attendance of 17 members.

Carterton.—A debate will be held with the W.D.F.U. A donation of £1 10s. will be made to A. and P. Association. A field day is to be held. Mr. E. T. Bliss spoke on "Porker Pigs: Carcass Conformation and General Judging Points." Twenty members present out of 23. Officers elected at the annual meeting: Advisory president, Mr. E. T. Bliss; chairman, R. McKenzie; secretary, F. O. Playle; treasurer, A. F. Haste; advisory members, Messrs. H. McKenzie and W. B. Campin. Attendance of 23.

Greytown.—The club recently resumed activities after being in recess for nearly five years. Officers elected: Advisory president, Mr. C. Ingley; chairman, V. Gates; secretary, A. Saywell; treasurer, S. Linton. Four members of the Wairarapa district committee, D. McLachlan, H. McKenzie, A. James, and J. Rose, spoke on aspects of the Y.F.C. movement. Fifteen members attended the initial meeting. A later meeting decided to send a letter of thanks to Mr. and Mrs. C. Ingley for their offer to present a cup, to be known as the Ray Ingley Memorial Cup, for annual competition among junior members. The chairman spoke on the points of a porker pig and the judging of dairy stock. Mr. W. V. Hadfield, Department of Agriculture, lectured on "Plant Breeding and Seed Certification." Attendance of 13 out of 15.

Masterton.—Members will attend a field day to be held on Mr. H. Morrison's property, "Awatoitoi," and also the district field day at Solway, where judging classes will include porker pigs, Ayrshire dairy cattle, and Romney and Southdown ram hoggets. The club has entered for the district efficiency contest, and will be represented at the Palmerston North educational week. Details of the roll of honour board were discussed. Members will attend lectures at the Wairarapa Training Farm, where rehabilitation students are being trained. A tour of the South Island was suggested and discussed. Arrangements were made for a club ball. Mr. S. R. Divers, manager of Perry and Co., spoke on "Pasture Seeds," emphasising the necessity to buy certified seeds for successful pasture establishment. Twenty members present out of 49.

Tinui.—Club reporter was elected. Mr. W. V. Hadfield, Department of Agriculture, lectured on plant breeding and seed certification. Seventeen members present out of 35. A successful field day was held on Mr. H. Morrison's property, "Awatoitoi," demonstrations including "'Rotational Grazing on Second- and Third-class Country" (Mr. H. Morrison); "Best Type of Station Hack" (Mr. R. Pilmer); "Polled Angus Bulls" (Mr. G. Laing); and "Romney Rams" (Mr. Southy). The attendance of 36 included 20 visitors.

SOUTHERN HAWKE'S BAY

Ballance.—Arrangements were made for a visit to Longburn freezing works. Mr. Wilsher spoke on the training of sheepdogs. Mr. Wilsher illustrated his talk with photographs, and also brought along a young dog and gave demonstrations in the hall. Full attendance of 22 members. Officers elected at the annual meeting: Advisory president, Mr. C. J. Eising; chairman, Q. Holdaway; secretary, R. C. Schroder; treasurer, C. Eising. Fourteen members present.

Kumeroa.—A newly-formed club. Officers elected: Advisory president, Mr. K. Mitchell; chairman, A. Compton; secretary, D. Druce; treasurer, E. Poulton; advisory members, Messrs. A. Ramsden and T. Bryant; club reporter, W. Poulton. Visitors were present from the Dannevirke, Woodville, and Mangatainoka clubs, together with the district chairman, Mr. I. Algie, and the district secretary, Mr. F. J. S. Holden. Mr. Algie presided over the meeting, and Mr. Holden outlined the many advantages offered by the Y.F.C. movement. Messrs. M. D. Murray and R. Martin, of Woodville, expressed the opinion that a good club could be formed at Kumeroa, and

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offered their co-operation. Nineteen members were enrolled at the meeting.

Mangatainoka.—Annual meeting. Officers elected: Advisory president, Mr. W. D. Harris; chairman, M. M. Osborne; secretary, C. V. Brown; treasurer, B. Brady. Twelve members present.

Woodville.—Annual meeting. Officers elected: Advisory president, Mr. M. D. Murray; chairman, R. Martin; secretary, D. Oxenham; treasurer, A. Clarke. Nine members present.

CENTRAL HAWKE'S BAY

Hastings.—Annual meeting. Officers elected: Chairman, R. Baddely; secretary and treasurer, M. R. Steele. Nine members present. A later meeting was addressed by Mr. A. D. M. G. Laing, Government Veterinarian, on "Facial Eczema, and Sterility in Dairy Stock." Attendance of nine members.

Matapiro.—The club recently resumed activities after four years of recess. Mr. A. W. Butt, a previous advisory president, gave a short account of the alterations to the Y.F.C. district boundaries; the Meeanee and Matapiro clubs, originally in the Northern Hawke's Bay area, are now included in Central Hawke's Bay. He expressed the opinion that there was a bright future for the club. Eight members attended.

Meeanee.—At the annual meeting nine members were present out of 16.

Otane.—Subjects for a field day at Otane will include Romney sheep (Mr. J. Tod), 10 a.m. to noon; Trees (Mr. R. Tod), 2 to 5 p.m. Mr. P. Plummer, Hawke's Bay member of the N.Z. Meat Board electoral college, spoke on "The Meat Board," and Mr. Lamont, Postmaster, Otane, spoke on "The Famine Relief Committee." Fourteen members present out of 17.

Waipukurau.—Annual meeting. Officers elected: Advisory president, Mr. J. W. Harding; chairman, P. Mills; secretary, B. Elliott; treasurer, H. McWilliam. Fourteen members present.

NORTHERN HAWKE'S BAY

Wairoa.—Annual meeting. Officers elected: Patron, Mr. A. C. deLatour; advisory president, Mr. H. Bayley; chairman, J. M. Brownlie; vice-chairman, R. Hill; secretary, I. McKinnon; treasurer, P. Jobson. A suggestion by the Dominion organising secretary that the club should be divided into two or more clubs was discussed, and carried over to be dealt with at an extraordinary meeting the following month.

POVERTY BAY

Gisborne.—Annual meeting. Officers elected: Advisory president, Mr. S. D. Briant; chairman, E. Tattersfield; secretary, D. G. Smith; treasurer, T. J. Atkins. Attendance of 27 members. At a later meeting a working committee was appointed to arrange a programme. All members present gave their ideas on activities to be included in the current year's programme. Twenty-seven members present out of 72.

TAUMARUNUI

Kaitieke.—Annual meeting. Officers elected: Advisory president, Mr. L. K. Couper; chairman, W. G. Couper; secretary, T. D. McFadyen; treasurer, J. P. Karam; advisory members, Messrs. J. Dempsey and V. Crocke. Free membership will be granted to returned servicemen until March, 1949. An invitation from Taumarunui club to attend a field day on Mr. C. Mills's property at Taumarunui was accepted. The full membership of 18 attended the field day.

Ohura.—Arrangements were made for a permanent meeting-place and supper facilities. The chairman reported on the A. and P. Association's field day for Y.F.C. members held recently at Taumarunui. General satisfaction with the field day was expressed. Seven members present out of 22.

Taumarunui.—Annual meeting. Officers elected: Advisory president, Mr F. Duncan; chairman, D. Wapp; secretary, N. Street; treasurer, D. Eggers. Ten members present.

TE KUITI

Otorohanga.—Annual meeting. Officers elected: Advisory president, Mr. Davis; chairman, C. Sanders; secretary, C. Sutton; treasurer, B. Bell. Seventeen members present.

Paewhenua.—Annual meeting. Officers elected: Advisory president, Mr. P. D. Crowley; chairman, W. Mexted; secretary, R. T. Millar; treasurer, M. McIvor. Twenty-one members present. At a later meeting the proposed dog trials were discussed and arrangements made for the annual dance. Seventeen present out of 22 members.

WAIKATO

Cambridge.—The chairman, R. Lang, reported on the recent combined field day, and G. Herbert on the recent meeting of the Waikato district committee. Dance arrangements were left to a committee. Mr. B. B. Blackmore, agricultural lecturer, Hamilton Technical School, spoke on farming in the South Island. Attendance of 22 members out of 48. The committee met after the meeting and discussed the forthcoming dance and club's roll of honour.

Elstow.—Arrangements were made for a field day. Sixteen members present out of 26. The field day took the form of a visit to the Horotiu freezing works, the party numbering 26, including seven farmer friends. The grading of carcasses was demonstrated by the supervising butcher, and the works manager spoke on the general management of the works. A talk on diseases of cattle and the inspection of carcasses was given by a veterinarian.

Eureka.—A newly-formed club. Officers elected: Advisory president, Mr. L. Masters; chairman, R. Townsend; secretary, L. Hunter; treasurer, T. Mair. The attendance was 15. At a later meeting the advisory president and the chairman outlined proceedings for the election of delegates to the district committee. The chairman also read extracts from the Y.F.C. constitution and answered questions. Attendance of 14 members out of 18.

Hamilton Technical High School.—Annual meeting. Officers elected: Advisory president, Mr. B. B. Blackmore; chairman, B. Leatham; secretary, G. R. Smith; treasurer, B. Dumper. The attendance was 76. At a later meeting an address was given by Mr. S. J. Sheaf, of the Herd Improvement Association, on "Herd Testing and Sire Survey Work." Mr. Blackmore spoke on "The Points in Judging a Friesian Cow" and outlined the milk and butterfat production of the breed. Seventy-six members present out of 83.

Hinuera.—Annual meeting. Officers elected: Advisory president, Mr. W. Oates; chairman, P. Blyde; secretary, D. McPhail; treasurer, A. Newman. Fifteen members present. Two field days were held. On Mr. J. Shaw's farm, Matamata, the owner gave a comprehensive demonstration of the maintenance of farm machinery. Members inspected ploughs and a wagon 25 years old in perfect condition. On Mr. P. Ward's property, Hinuera, Mr. W. Oates demonstrated the points of an Ayrshire cow, and Mr. W. C. Wallis lectured on two pig carcasses, a baconer and a porker. Mr. Wallis then spoke on pigs in general and demonstrated the castration of young pigs. Attendances of 16 and 22 at the field days.

Kakepuku.—A radio talk from 1YA, Auckland, and the club efficiency contest were discussed. A report was received from two delegates who attended the annual meeting of the Waikato district committee. Fourteen members attended the district field day held on Mr. Chynoweth's property. Mr. C. Eyre spoke on experiences in the Long Range Desert Patrol. Sixteen members present out of 22.

Kereone-Kiwitahi.—A newly-formed club. Officers elected: Advisory president, Mr. R. Young; chairman, N. Wells; secretary, P. Mortensen; treasurer, P. Milliken. Attendance of 17.

Ngahinepouri.—The club decided to take an interest in the local community centre and to place a wreath at the local Anzac Day service. Impromptu speeches were given by members, and Mr. Paul demonstrated rope splicing. Thirteen members present out of 17.

Okoroire.—The alteration of boundaries and the formation of a new district committee were discussed. Reference was made to the new reduction in rest room fees and the operating of a banking account. Two field days were proposed. Mr. Patterson, Government Apiary Instructor, spoke on "Wasps in the Waikato." Mr. Bamfield showed interesting lantern slides on a variety of subjects. Thirty-three members present out of 52. Twenty members attended the Tirau-Putaruru Dog Trials on Mr. Totman's property. Mr. Frazer-Smith, a prominent figure in New Zealand dog trials, explained the objects of trials and detailed the events, following this with a commentary on the runs of some of the dogs. There was an attendance of about 220.

Springdale.—Annual meeting. Officers elected: Advisory president, Mr. J. Singers; chairman, G. Roberts; secretary, M. Barlow; treasurer, S. Old. Twelve members were present. At a later meeting an impromptu debate took place on "Loose Hay v. Baled Hay." Mr. Palliser was judge, and the speakers were: R. Ladd, M. Barlow, and K. Bennett (baled hay); G. Roberts, S. Old, and E. Davison (loose hay). The result was a draw. Nine members were present out of 19. A party of 18 members inspected the Horotiu freezing works, where Mr. Kneebone, the Supervising Meat Grader, spoke on "Grading of Meat," Mr. Toulson, veterinarian, on "Diseases in Condemned Stock," and Mr. Hill gave a talk on stock drives, explaining how cattle are marked and can be traced through the works.

Tahuna.—Annual meeting. Officers elected: Advisory president, Mr. R. Leach; chairman, D. White; secretary, A. Stewart; treasurer, V. Towler. Nine members were present. The next meeting was "subscription night." The new committee was welcomed by Mr. D. Waide, the club's advisory delegate to the district committee and chairman of that body. A field day to be held at Cambridge was discussed and arrangements made for a club field day dealing with the care, management, and breaking-in of horses. A dance will be held, and a special committee was appointed. Ten members present out of 20.

Te Awamutu.—A club debate will be held at the next meeting. A social committee was appointed. A reminder was given of a broadcast talk from 1YA, Auckland, and suggestions made for future activities. A lantern lecture was given by Mr. E. P. Neilsen, consulting officer to the N.Z. Dairy Board, on "Sire Survey Work"; he dealt with the wastage in dairy herds and herd improvement. Eighteen members present out of 28.

Waerenga.—Mr. F. B. Smith, an Australian visiting the Dominion in connection with the wine industry, gave an interesting talk on wine making. In a club debate, "That horses are more suitable for general farm purposes in the Waikato than tractors," R. Hoult led the affirmative and R. Keith the negative; the judges, Messrs. A. R. Cadwaller and J. McNaughton, awarded the decision to the affirmative. Mr. McNaughton criticised the speakers and gave valuable advice on debating. Forty-five members present out of 50.

Wardville.—Fortnightly meetings are being held. A general discussion took place on the subject of horses v. tractors. Twelve members were present. At a later meeting arrangements were made for a field day at the Waharoa dairy factory. Two new members were enrolled. Two radio lectures read to the meeting were followed by a discussion. Fourteen members present out of 20.

THAMES

Netherton.—A programme of future activities was prepared; many useful suggestions came from members. Mr. E. Clark, District Pig Supervisor, gave a lantern lecture on "Pigs and their Management"; he answered questions on management and feeding. Messrs. Denize

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and Morgan, visiting members from the Pukekohe East Y.F.C., gave some valuable advice and an interesting account of the activities of their own club. Twenty-four members present out of 29.

ROTORUA

Putaruru.—An advisory committee was elected. Mr. McDiarmand, a local veterinarian, lectured on "Diseases of Stock and their Treatment." Full attendance of 18 members.

WESTERN BAY OF PLENTY

Tauranga.—Annual meeting. Officers elected: Advisory president, Mr. L. Ferguson; chairman, B. Murray; vice-chairman, J. Carlyle; secretary, G. Rowlandson; treasurer, E. Kirk. A proposed athletic meeting was discussed, and a report was given on a very successful fishing trip. Arrangements were made for a debate. Seventeen members present out of total of 37.

EASTERN BAY OF PLENTY

Edgecumbe.—Annual meeting. Officers elected: Advisory president, Mr. I. B. Gow; chairman, J. Hawker; secretary, G. M. Crang; treasurer, A. Gow. Attendance of 12 members.

Awaheri.—A newly-formed club. Officers will be elected at a further meeting.

Opotiki District High School.—Annual meeting. Officers elected: Advisory president, Mr. F. Grant; chairman, L. Black; secretary, A. Paterson; treasurer, C. Edwardson. Forty members were present. At previous meetings lectures were given as follows: Talk and demonstrations on dairy, piggery, and horse-judging, by Mr. B. Black; lecture and demonstration on sheep-shearing and wool-classing, by Mr. Gordon; demonstration of nursery work and grafting of fruit trees by Mr. Johnson; lantern lecture by Mr. E. C. Marryatt, Department of Agriculture, on "Food Flavours in Milk, and the Farm Water Supply."

Thornton.—T. Mexted was appointed club Press reporter. The subject for debate was "That the Single-unit Farm is the most Efficient and Economical for Production." The speakers were M. Law, A. M. Ellis, and R. Craddock (affirmative); R. Cleland, C. Martin, and A. Martin (negative). Eighteen members present out of 32.

Waimana.—A dance will be held to raise funds. Members gave impromptu speeches to assist in the selection of a debating team. Two teams were selected to debate the subject "That the Single-unit Farm is the most Efficient in Dairy Farming"; Mr. Heather was judge. Fourteen members present out of 24.

AUCKLAND

Clevedon.—Two new members were enrolled and arrangements were made for a dance. Mr. Yockney, veterinarian, Franklin Veterinary Club, spoke on "Farming and Diseases of Cows in England." Attendance of 26 members out of 45.

East Tamaki.—A dance will be held, the profits to go to club memorial fund. A field day will be held at Te Aroha. Four new members were enrolled. Subjects for impromptu speeches were drawn from a hat, and twenty members took part—A. Shaw ("Town Milk Supply v. Butterfat"), L. Johnson ("Horses v. Tractors"), R. Greenwood ("Benefits of Tours"), W. Landon ("North v. South Auckland"), E. Wright ("The Best Season for Topdressing and Why"), W. Thomas ("Hedges and Shelter Belts"), J. Swaffield ("Cropping v. Grassland Farming"), L. G. Black ("Cheese v. Butter"), L. Halverson ("Pressing v. Haystacking"), M. J. Green ("Should We Encourage Interclub Competition and Why?"), P. Dawson ("Stripping v. Non-stripping"), H. Anderson ("Benefits of Field Days"), E. Thorburn ("Mechanisation of Farms"), D. Stone ("Benefits of Debates and Discussions"), B. Green ("Methods of Farm Management to Increase Winter Milk"), W. B. Litter ("Opinions for and against Topdressing with Stockyard Manure"), L. Shaw ("How to Produce Clean Milk with a low Bacteria Count"), H. B. J. Webb ("Contractor v. Co-operative Ownership of Heavy Farm Machinery"), A. Wright ("Should Paspalum be Encouraged in Pasture"), and R. Pegler ("Your Opinion of Heavy or Light Harrows in Pasture Management"). At the conclusion L. Lansdown spoke on his experiences overseas. Twenty-six members present out of total of 39.

Franklin.—Dance arrangements were completed. An appeal for blood donors by the St. John Ambulance met with a good response. The result of the farm plan competition was: S. Adeane 1, E. Black 2, A. Holmes 3. A debate was held on the subject "That a Programme of Cropping in Conjunction with Grass is More Profitable than Straight Grassland Farming." The speakers were L. W. Aldridge, S. Adeane, and H. Kirton (affirmative), C. Upton, L. Shaw, and W. Dunn (negative). Both teams had put a lot of preparation into their subject, and a good debate resulted, the award going to the affirmative. Full attendance of 25 members.

Harrisville.—Annual meeting. Officers elected: Advisory president, Mr. X. Drumgool; chairman, W. A. Barnany; secretary, J. D. Hyland; treasurer, E. Smith. Eleven members present.

Mangatawhiri.—The club recently resumed activities after being in recess during the war. Officers elected: Advisory president, Mr. V. C. Hastie; chairman, L. A. McLaren; secretary, T. Young; treasurer, C. Crum. Twelve present.

Pukekawa.—One new member was enrolled. The chairman reported on the programme for the year. Three cricket matches were held during the month preceding the meeting. Prepared five-minute speeches were given as follows: H. Geraghty ("Rotational Grazing"), F. Lozell ("Topdressing"), L. Reade ("Harrowing"), S. Logan ("Phosphates of Calcium"), P. Savage ("Carrot Growing"), S. Brewster ("Deterioration of Farmlands"), B. Logan ("Lime"), W. Greer ("Herd Testing"), H. Cathcart ("Shelter Belts"), A. Miers ("Government Herd Testing"), L. Hunter ("Pampas Grass"), R. Parker ("Pig Types"), and K. McNeill ("Fencing"). N. Murray gave constructive individual criticism. Nineteen members were present out of 22. Officers elected at the annual meeting: Advisory president, Mr. J. L. Cathcart; chairman, H. Cathcart; secretary, R. F. Parker; treasurer, S. Logan. It was decided to appoint a junior vice-chairman to preside over meetings twice a year to train and encourage younger members; K. McNeill was elected. Twenty members present.

Pukekohe East.—Representatives of Auckland Hospital and St. John Ambulance attended; members present gave two gallons of blood for the blood bank, following the example set by the Franklin club. Twenty members were present out of 43. Officers elected at the annual meeting: Advisory president, Mr. R. M. Cowan; chairman, S. S. Denize; secretary, C. J. Morgan; treasurer, R. F. Morgan; club reporter, L. L. Harris; auditor, Mr. G. J. Williams. Thirty-one members were present. At a later meeting, attended by 33 members, Mr. V. Brown, architectural instructor, Auckland University, gave an interesting address on house planning.

WARKWORTH

Matakana.—A newly-formed club. Officers elected: Advisory president, Mr. H. Linton; chairman, J. Bassett; secretary, L. T. Clayden; treasurer, B. de Luen. Fifteen were present. At a later meeting a general discussion took place on the activities of the club, and a social committee was appointed. Mr. H. A. Mellville spoke on ranch life in America, dealing with some aspects of American life as seen during his travels through 36 States. Two new members were enrolled. Sixteen present out of 17.

Warkworth.—The club recently resumed activities after a period of recess during the war. Officers elected: Advisory president, Mr. F. D. Miller; chairman, R. K. Hudson; secretary, I. C. Macfarlane; treasurer, R. Langridge. Attendance of 22.

Wellsford.—This club also recently resumed after a recess. Officers elected: Advisory president, Mr. G. Pool; chairman, H. W. Logue; secretary, T. F. Waldrom; treasurer, G. W. Henson. Attendance of 11.

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JANUARY — AND JUNE

NEARLY all of us make good resolutions each New Year. We turn our backs on the failures and disappointments of the past and survey the unexplored and as yet unspoiled vistas of the future with feelings of optimism and deep thankfulness for the chance to make a fresh start. Thus we set off once more, equipped for the venture not only with the confidence engendered by successful achievement, but with the wisdom (often so painfully acquired) that is the reward of being brave enough to learn from our previous mistakes.

Yet, no matter how sincere and well-meaning our intentions, they will have little influence on our lives and those of the community if we lack the staying power which enables us to transmute our ideals into actuality. I often think of the prayer Sir Francis Drake offered up before the expedition against Cadiz: "O, Lord God, when thou givest to thy servants to know that it is not the beginning but the continuing which yieldeth the true glory." In wartime there is the stimulus of danger, the fanfare of patriotism, to inspire us to extraordinary endeavour, but peacetime living for the average person is much less spectacular and seems rather humdrum in comparison. So often monotony is the enemy which insidiously saps incentive, and when it is allied with discouragement and weariness of spirit we have to be specially on our guard lest projects begun in a glow of exaltation peter out through want of continued diligence.

We are prone to envy the accomplishments of other people, attributing their success to good luck instead of to persistent and painstaking effort. We are so impatient to see the results of our labours that we forget "great works are not performed by strength but by perserverance." For instance, we may have wanted to give others pleasure with our music, yet we shirk the long hours of tedious practice essential to the development of our talent. We admire the lovely tapestries adorning the home of Mrs. X., but then, we sigh, she has such a lot more leisure for that sort of thing than we have. Even so, the fact remains that the simplest design is done only stitch by stitch, and we could probably become just as proficient with the needle as the aforementioned lady if we bothered to make the most of the odd moments that come our way. After listening to some interesting speaker perhaps we have felt that we, too, would like to test our ability to hold an audience, but how many of us are prepared to expend the thought and research and effort which have gone into the preparation of that apparently simple lecture? (I once read that President Roosevelt sometimes made as many as twelve drafts of a speech before he was ready to present his ideas to the world).

The same thing applies to writing or the arts of any kind. The other day I was shown a water-colour by a friend who has taken up painting only within the past year or two. Her subject was still life and, in place of the customary bowl of fruit or porcelain plate or figurine, she had depicted a jade necklace and a jar of unusual shape against a drape of brocade. Colouring and composition were particularly pleasing, and the picture evoked all sorts of vivid images in the mind of the beholder—crowded bazaars; exquisite treasures wrought therein by skilful craftsmen; the colour and romance that is the East. When I had expressed my delight and congratulations she handed me a pile of preliminary sketches from which the present picture had evolved. They represented months of hard work sandwiched in between a multitude of other duties, I knew, and as I studied those first outlines with their obvious faults and crudities, and noted the continuing improvement in the successive sketches till they culminated in the finished painting, I admired my friend's patient perserverance even more than the beauty she had created with her brush.

Those of you who are mothers will know the necessity of constant "keeping at it" in the training of your children. The inculcating of good habits, the establishing of high standards of thought and conduct, cannot be achieved in any limited period, but must be maintained over the years. Arduous as the task undoubtedly is, it is one of the most valuable contributions women can make to the welfare of the nation—

The tumult and disorder of the world
Strike at my heart,
Yet for the stirring of a brew that heals
I have no art.
But if I keep my own hearth free from blight,
My small world sure,
There is one altar in the universe
That will endure.

Whatever your occupation, whatever your resolve, if after long endeavouring success still seems far from attainment, there is much comfort to be gained from these words of George Eliot's: "Failure after long perserverance is much grander than never to have a striving good enough to be called a failure."

We have not all been gifted
With powers in the arts
That emulate the masters,
Whose genius stirs our hearts;
But noble deeds and noble thoughts,
To these we may aspire,
They sound the depths of chivalry,
And strike the minstrel's lyre.

The Good Neighbour

by Mary

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PLANNING MEALS FOR GOOD NUTRITION

[*Auckland Weekly News photo.*

A TRUE view of good nutrition must see it as standing on equal recognition of its water, energy, protein, mineral, and vitamin aspects. We are not likely to go short of the first two mentioned in times of plenty. It is possible, if we do not know where to find the proteins, the minerals, and vitamins, to go short of one or all of them. Freedom of choice amid plenty without knowledge of food values to guide the choice does not result in good nutritional status. Fortunately for us the human body is very adaptable and will carry on under both overloads and shortages of the various nutrients for a considerable time, though not without effect on the individual's well-being.

Most country people can recognise quite easily the characteristics of a good cow or sheep or a good ear of corn, but can they recognise the characteristics of a well-nourished human being?

WHAT are the "outward and visible" signs of good nutrition? There are, of course, the inevitable differences caused by age, sex, race, and family. People vary in body shape and size, even at the same age; some will be tall and slender, others short and stocky. They differ also in colour of hair, eyes, and skin and other characteristics, but with all these differences people who are well nourished have certain characteristics in common. First there is a general appearance of well-being, physical fitness, ability to do things and to enjoy life. There is an air of contentment, vigour, and interest. The body is upstanding; the eyes are clean and bright; the facial expression is alert. Appetite and digestion are good, elimination is regular, and sleep is sound and refreshing.

"The bony framework of a well-nourished person is strong and well built. The teeth are well formed and sound. The gums are firm and light pink and hug the teeth closely—there is no tendency to bleeding. The muscles are well developed and strong, the posture is erect and shows true, proper balance of the various muscles. The tissues beneath the skin are firm. There is a good supply of red blood shown in pinkish colour of the lining of the mouth and eyelids, the ears seen against the light, and the fingernails."*

This gives a very desirable picture, and it could be the picture of the majority of the people in this well-endowed country. Do we desire it? The problem everywhere is **to know what good nutrition is and to desire it.**

Those who plan meals do not have to carry in their heads the calorie values of the fifty-odd foods that we eat; or their percentage composition of first- and second-class protein; or the amounts of calcium, iron, iodine, and phosphorus in these foods and the distribution of the vitamins among them. If they try to do it, one or another of the necessary factors tends to absorb their attention to the exclusion of others. It is easy to strain facts of which we seem certain to explain conditions which are complex and probably result from more factors than the ones we know. After all, the science of nutrition is still young and much more may be discovered. But if 50 more vitamins are found to exist, they will still exist in the natural foodstuffs in quantities and combinations adequate to the needs of the body. Perplexed as we sometimes can be, it is well to remember this and rely on fresh natural foodstuffs to supply our needs. No one foodstuff can meet all our needs. For example, meat is poor in starch, sugar, and roughage; vegetables and fruits are poor in protein and fat. We need to base our meal planning on a mixed diet.

In her first four articles on nutrition Dorothy Johnson, Rural Sociologist, Christchurch, has discussed

1. **What the day's food should contain and why; and**
2. **The most important contribution to the body's need of some common foods.**

For handy reference these have been summarised in two tables, table I in the vitamin article and table III in the mineral article.

In this article she deals with the amount of each kind of food that should be included in the day's meals and how to plan them.

Food Groups

In daily catering it is easier to remember the different groups of foods by the function they perform or the use they have in the body, rather than by their chemical composition. There are the **warmth- and energy-producing foods,** of which bread, butter, honey, potatoes, rice, sweets, and cakes are a few. There are the **body-building foods** (proteins), namely milk, meat, cheese, fish, and eggs, which consist of much the same stuff as the body. They are helped by the many vegetable foods like peas, beans, and bread. Finally there are the **body-protecting foods,** which protect the body from disease. This group can usefully be thought of as divided into three types—the **dairy foods,** the **garden foods,** and the **sea foods**—to

TABLE I—BALANCE YOUR MEAL.

Body Workers & Warmers	Body Builders	Body Protectors
STARCH, SUGARS, AND FATS:	ANIMAL PRODUCTS:	DAIRY FOODS:
Bread, cereals, pulses, potatoes.	Cheese, milk, meat, fish, eggs.	Milk, butter, cheese, eggs.
Honey, jam.	VEGETABLE PRODUCTS:	GARDEN FOODS:
Butter, margarine, suet.	Cereals (wheat, oats, barley, rye).	Salads, greens, tomatoes, carrots, oranges, lemons, and other fruit.
	Pulses (peas, beans, lentils).	SEA FOODS:
	Nuts.	Fat fish, roes, liver oil, seaweed.

* Adapted from "The Road to Good Nutrition," by Dr. L. Roberts.

ISSUED BY THE DEPT. OF HEALTH

The New
STANDARD LOAF
will soon be on the market

There is a world shortage of wheat. Economy in its use is essential.

New Zealand Mills are increasing their flour extraction rate from about 73% to 80% — that is, they are using about 7% more of the wheat grain in the production of flour.

The increase in the extraction rate will mean an increase in the nutritive value of the bread, and all things made from the new flour.

The texture and flavour of the new loaf will not be very much different from that of the white loaf, though the extra wheat-germ content of the flour may colour it a little. However, much of the valuable nutritional minerals (such as iron) and the vitamin B factors (especially vitamin B-1) will be retained. In the highly-refined white flour to which we have become accustomed a big proportion of them was discarded.

And try saving bread at home, too. By eating more potatoes and less bread, you, as an individual, will help to make our wheat go further.

KEEP THIS ANNOUNCEMENT FOR FUTURE REFERENCE

FOR A HEALTHIER NATION

bring home the fact that some from each of the three types need to be chosen (see table I).

In group II (body-building foods) each of the first five mentioned can replace any of the others in different quantities. Some foods are in more than one group. In fact groups II and III could be put together under the heading **body-building and protective foods.** This division is to give a useful and easier guide to meal-planning for busy people.

Quantities Required

The next step in planning meals is to know the quantities of each food required in a day. As the protective and body-building foods are the ones likely to be missed, it is best to plan the quantities required for the individual and the family, make them the basic foundation of the meals spread through the day, and then supply the body-warming foods to satisfy the varying appetites of the group. In other words **eat what you want after you have eaten what you should.** Appetite can be satisfied at different levels of cost. Using the guide in table I, the quantities would be, for an adult:—

DAIRY FOODS	Milk: 1 pint. Cheese: 1 to 2oz. Butter: 1oz.; other fats as needed. 1 egg.
GARDEN FOODS	Fruits, especially citrus fruit or tomatoes. Green and yellow vegetables (some raw). Potatoes.
SEA FOODS	4oz. fat fish once or twice a week. 1 to 2 teaspoons of cod-liver oil.
MEAT	4oz. when fish is not in dietary.

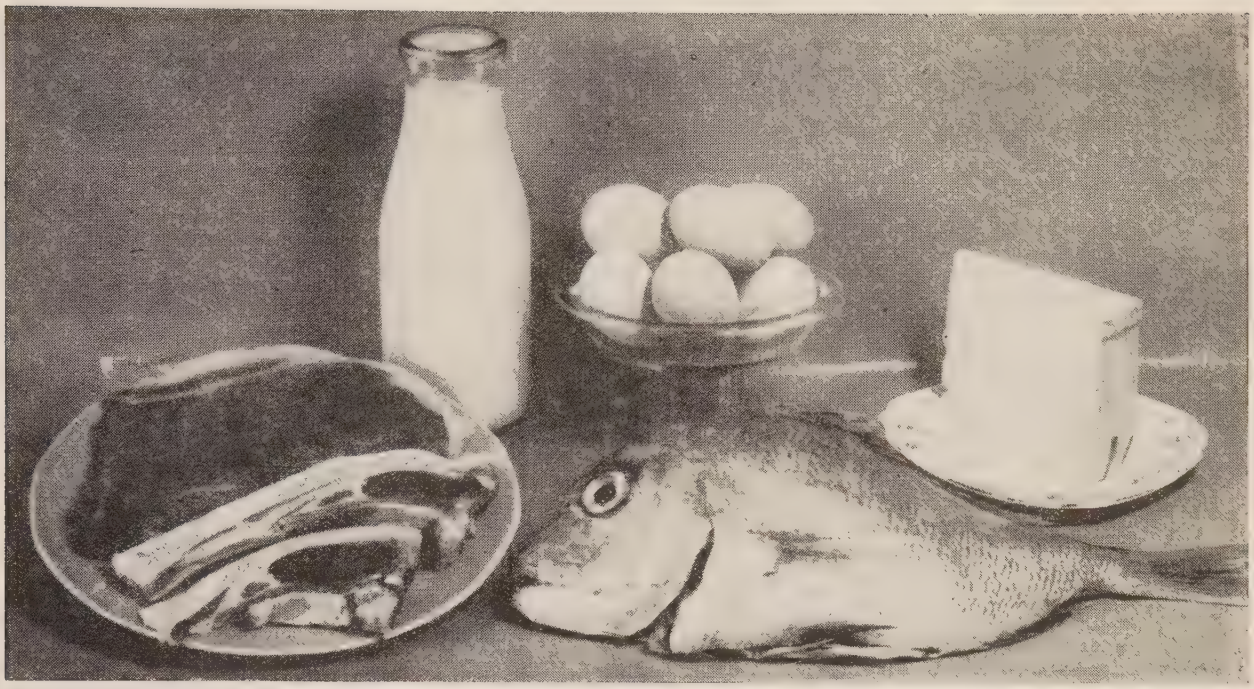
These are the fundamentals to be supplemented by bread, porridge, honey, jam, peas, beans, etc. The quantities required by different members of a family are clearly set out in a table on page 3 of the new booklet "The Family's Food" which is obtainable from the Department of Health.

TABLE II—A WELL-BALANCED DIET.

From the Department of Health's New Bulletin "The Family's Food."

MILK: 1 pint or more for adults.
1¼ or preferably 1½ pints for the child of 1 to 2 years.
1¾ pints for older children and young people, and for expectant and nursing mothers.

MEAT: From 1oz. for the child of 1 to 2 years up to 4oz. for the



First-class protein foods. [*Sparrow Industrial Pictures photo.*

adult. Liver or kidneys once a week, if possible; fish once a week, if possible.

EGGS: 1 a day when available. (Peas, beans, lentils, and peanuts, or more milk, cheese, meat, and fish, will help to make up for eggs when they are unobtainable).

CHEESE: Use frequently, grated for young children, in slices or in cooked dishes for older children and adults.

POTATOES: Once or twice a day.

GREEN VEGETABLES: Liberal amounts for older children and adults.

FRUITS: Especially tomatoes, tree tomatoes, oranges, and grapefruit. Apples, bananas, and other fruits also.

BUTTER: 1oz. a day for adults. Other fats as needed, the amount depending on climate and occupation.

BREAD AND CEREALS: Enough to satisfy the appetite. After children are two years of age wholemeal bread is preferable.

COD-LIVER OIL: A teaspoon a day for children and adolescents; 2 teaspoons for expectant and nursing mothers, and for infants under 1 year. Adults will also benefit by taking a teaspoon of cod-liver oil in winter and spring. Other fish-liver oil or suitable preparation may be taken instead if it contains sufficient vitamin D.

IODISED SALT: Only iodised salt salt should be used in the home. As an alternative, two teaspoons of seameal, if taken every day without fail, will do instead.

For a more general use of cod-liver oil, the following hints from the book "The Nation's Larder—the Housewife's Part Therein" will be welcome.

"The sauce, whether it be a white sauce or mayonnaise, served with fish can have cod-liver oil incorporated into it without the recipients being aware of it. In the same way cod-liver oil may be added to the batter in which fish is fried. Strange to relate, cod-liver oil cannot be tasted if it is incorporated into gingerbread."

Safeguarding Essentials

One of America's foremost authorities on nutrition, Dr. H. C. Sherman, suggests two helpful rules for safeguarding the essentials of the diet. The first is that at least as much should be spent on milk and cheese as is spent on meat and fish (including poultry); the second is that at least as much should be spent on fruit and vegetables as is spent on meat and fish. He remarks that to carry the two rules out in America would mean a reduction in consumption of meat, a moderate increase in fruit and vegetables, and a large increase in the consumption of milk.

The New Zealand Department of Health's book "Good Nutrition" states that the Dominion's dietetic errors could be remedied by reducing the consumption of meat and sugar and spending the money saved on more milk, cheese, eggs, and vegetables.

In England too where meals fall short it seems to be in milk, green vegetables, citrus fruits, and tomatoes. In every case this means a loss of calcium, iron, and vitamins A, B, and C.

Take these American figures about milk consumption:—

44.4 per cent. of men drink no milk.
49.4 per cent. of women drink no milk.
9.5 per cent. of children (6 to 12 years) drink no milk.
13.3 per cent. of children (13 to 18 years) drink no milk.

What would similar figures show in New Zealand?

Planning of Meals

We have now crossed the bridge between calories, proteins, minerals, and vitamins, which are necessary for good nutrition, and the familiar foods that contain them. We have discussed how much of each kind of foods is required to meet the body's needs. So planning the family's welfare in terms of tomorrow's breakfast, lunch, and dinner is now possible.

Members of families vary in ages and occupations, weights and conditions, needs and preferences, and housewives vary in their capacities, skills, strength, and the means at their disposal for producing meals. But meal-planning is the secret of

success in looking after the family's nutritional welfare. Everyone has a vital interest, direct or indirect, in the planning of meals. Enjoying appetising and satisfying meals is one of the comforts and pleasures of life, and it is a pleasure associated with much enjoyable social intercourse, which is in fact stimulated by it. To children the difference between good and bad meals will make the difference between a well-developed body with abundant vitality and high resistance to disease, and a stunted, poorly-developed body with little strength and great susceptibility to disease.

The problem is to provide the foods listed in the tables above in the form of three meals daily. The day's meals should be planned as a whole, each supplementing the others and planned ahead. In addition it is wise to have a week's meals planned so as to introduce variety from day to day, to utilise left-over foods, and to cut down the labour of preparation.

Here is a hint from menu planning in institutions: If the unit of planning is three weeks instead of one week, the appearance of the same food on the same day of the week is avoided. To know that there will be corned beef for dinner because the day is Saturday is very dull and uninspiring. But no one can remember what they ate on Monday three weeks ago.

Allow time for the job of planning meals and if possible do it when you are hungry. The imagination works a lot better then.

General Rules

Some very good general rules for menu planning have been worked out by Dr. Jean Bogert:—

1. Have breakfast relatively simple and standardised, then plan dinner, and last plan luncheon or supper so as to supplement the other two meals.

2. Use some food from each of the food groups daily. The main protein food is usually in the dinner.

3. Use some raw food at least once a day.

4. Plan to have in every meal at least one food that has staying quality or high satiety value, at least one food that requires chewing, one which contains roughage, and generally some hot food or drink.

5. Combine or alternate bland foods with those of a more pronounced flavour.

6. Combine or alternate soft foods with those crisp in texture.

7. Have variety in colour, form, and arrangement of foods.

8. Alternate simpler and less nutritious dishes with those which are richer, more nutritious, and harder to digest.

9. Simple meals with fewer dishes and larger servings are as good if not better than more elaborate meals. Secure variety from day to day.

Don'ts for Menu-planners

1. Do not have a preponderance of one foodstuff in a meal.

2. Do not have many foods that are rich or hard to digest in one meal.

3. Do not use the same food twice in one day without varying the form in which it is served—except of course staples like bread, butter, and milk.

4. Do not use the same food twice in the same meal even in different forms.

5. Do not use the same foods too constantly even from day to day.

6. Avoid monotony of colour, texture, and flavour.

These rules are really only suggestions. Variety is good, but most people would be satisfied with a good deal less variety in their meals if they benefited from the economy of cost and labour of preparation. Take rule 1 in the first group. Though breakfast can be standardised and simple in many cases, there are others when it must be used to put into the day's diet something that would otherwise be missing. If there are times when it is the only meal taken at home fresh vegetables and sauces can be introduced. Children, especially adolescents, need a substantial breakfast with a protein dish like eggs or fish as well as cereal, milk and toast, especially if they take their lunches with them. Good lunch patterns have been demonstrated in the March issue of the "Journal." Where the main meal is in the middle of the day a lighter breakfast suffices. One meal supplements another in some respects.

Breakfast is usually a starchy or energy-giving meal, with some of the day's vitamins in the form of fruit and some of the day's first-class protein. Dinner is the high-protein, mineral salts, and vitamin meal. Lunch or supper should be planned to round out the day's rations in the essential body-building and protective foods with ample energy foods to satisfy the appetite. All the essential foods in table I should be worked into some of the meals. In winter hot milk or cocoa makes a good nightcap.

The total amount of all foods taken by adults should be such that they neither gain nor lose weight. People who are above or below their weight should modify their energy food intake accordingly, but they should not cut down their daily quota of protective foods (milk, fruits, and vegetables, especially leafy ones).

Accompanying this article is a meal-planning pattern (table III) with a few days' foods filled in. It is designed to make easy the balancing of menus nutritionally. The essentials stand out for a quick check-up of the milk, the green salad vegetables, the first-class protein, etc., included in the meals. Some of the staple foods

Remembrance

I will bring you remembrance
In a cloak of sombre hue,
Dreams of your own dear loved ones
Who have so long been lost to you.
Yes, I will bring you remembrance
Of laughter, sorrow and strife,
For all of these things together
Make the lessons we learn from life.
—M.N.

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like fat and sugar have been left out. Their consumption is seldom too little; it generally needs reducing in this country and rationing does that now.

Another help in quick meal planning is a check list of favourite dishes which include the dietary essentials. In New Zealand we are not accustomed, on the whole, to a variety of fruit and vegetable juices and cocktails at the beginning of a meal, though they are gaining in favour. We are only too pleased to be able to get citrus fruits and tomatoes themselves.

Prepare a list of protein-rich dishes in which leftovers can be incorporated, another of salads with fruits, and another of desserts. Here are a few suggestions for the first-named:—

SOUPS—

Cream of vegetable;
Cream of oyster;
Lentil, pea, or bean;
Chowders of beans, fish, or bacon and vegetable.

SALADS—

A variety of raw green stuffs;
Meat, pickle, and celery;
Apple, walnut, and raisin;
Tomato stuffed with meat or fish;
Fish, carrot, and celery;
Ham and macaroni;
Tomato aspic with meat or fish;
Egg and beetroot.

VEGETABLE PROTEIN DISHES—

Baked beans and ham or bacon;
Lentil loaf;
Bean and nut loaf.

MADE DISHES, using eggs and cheese, fish, meat, and milk—
Carrot cheese custard;
Casseroles of meat, vegetables, and macaroni, rice, etc.;
Creamed fish or meat or vegetables;
Fish puddings and loaves;
Macaroni and cheese;
Omelet with creamed fish or meat;
Souffles and fondues with cheese or meat;
Plain stews and curries.

It is a good idea to have "request dinners" occasionally. Let the family take turns at choosing the pudding for the next day's dinner or on one day a week—say Sundays. The one who chooses can help to make the rest of the meal fit it nutritionally.

Using Leftovers & Saving Time

The general principles of using leftovers and saving time and labour are well known if not so well observed. They fit together in a well-planned week's meals. Using up leftovers is really an art in itself and, far from being a disgrace, is especially necessary today. To carry over foods from day to day should be planned deliberately. It saves time, fuel, and labour. In any case leftovers are inevitable with sudden changes in the number at meals, or fluctuations of appetite, though the latter should usually be met in the well-keeping energy foods and not in the dietary essentials.

BONFIRE

You need three things for burning leaves:
A rake, a match, and by your side
(To make the ceremony true)
A child to watch you, all wide-eyed.

Economy of time and fuel in preparing meals is obtained by using the same method of cooking for most of the foods in the same meal—in the oven when a joint is baked; when using a meat or fish which is quickly cooked have vegetables and pudding that can be cooked quickly or prepared beforehand. Serve fewer foods at a meal and use a good many raw, both of which practices are to be encouraged in the interests of our physical wellbeing.

Plans for weekly menus in the different seasons and for differing family needs have not been included in this article as they are available to New Zealanders in two booklets issued by the Department of Health—

"Good Nutrition," price 1/- in many bookshops.

"The Family's Food," a new booklet available on request from the Department of Health.

"The Family's Food" is an attractive booklet which should be in every kitchen for reference. It supplements "Good Nutrition," describing briefly the food we need and the contents of a well-balanced diet in simple, non-technical terms. A valuable section on rules for the table and kitchen is enlivened by delightful and humorous sketches. There is a section on "Grading the family's food," and to it are appended "Food plans for the day" and "Menus for a week" for different age groups.

Acknowledgments

Acknowledgments are made to both books mentioned above;
to Dr. Jean Bogert's book on "Nutrition and Physical Fitness";
to Julia Lee Wright's "Kitchen Nutrition";
to "The Nation's Larder";
to Mottram's "Food and the Family."

TABLE III—MEAL-PLANNING PATTERN.

(Adapted from "Kitchen Nutrition" and Department of Health's menus).

Remember that to make a meal interesting there should be contrasts in colour, texture, flavour, and temperatures.

DAY	MEAL	MILK	PROTEIN-RICH MAIN DISH	GREEN VEGETABLES AND SALADS	STARCHY VEGETABLES, BREAD, CEREALS	FRUIT AND DESSERTS
Sunday	Breakfast	Plain and in coffee (1 cup)	Poached eggs		Toast	Apple
	Dinner		Stuffed steak	Cabbage	Potatoes	Fruit salad
	Tea	Tea and cocoa	Cheese and nuts	Lettuce	Honey, pikelets, raisin spice cake	
Monday	Breakfast	Plain and in coffee (1 cup)	Grilled chops		Porridge, toast, marmalade, fried potatoes	Orange
	Dinner	In custard	Brown stew	Leeks	Mashed potatoes	Carrot whey fluff and custard sauce
	Tea or lunch	Tea and cocoa	Baked vegetable cheese custard	Mixed vegetables	Bread, jam	
Tuesday	Breakfast	Plain and in coffee	Scrambled egg and bacon		Toast, marmalade	
	Dinner	In pudding	Haricot mutton chops	Onion, spinach	Potatoes	Raw apples, seameal shape
	Tea or lunch	Tea and cocoa	Cheese	Lettuce and vegetable salad	Wholemeal scones, honey	

The meals given above for 3 days of the week are examples of how meals may be planned for the complete week.

Chrysanthemums

WELL-GROWN border chrysanthemums provide a wealth of rich colour in the late summer and autumn. They are, however, often disappointing because of neglect or the ravages of the chrysanthemum eelworm. In this article J. P. Hudson, of the Horticulture Division, Department of Agriculture, tells how border chrysanthemums should be grown. The treatment for eelworm and other pests and diseases will be described next month.

Single chrysanthemum—Lady Sargood: brick red with gold reverse and attractive gold "halo" around the gold centre.

Preparation of the Soil

As with most things in life, when growing chrysanthemums you usually "get what you pay for" and no more. To plant chrysanthemums in a poor, droughty bed which has not been manured for years is to court failure. Nor can much bloom be expected from plants left year after year in the same bed without being lifted, as chrysanthemums need much greater care than is usually given to herbaceous perennials.

Any reasonably deep soil can be made suitable provided it does not become waterlogged in wet spells, but first-class plants can be grown only if the soil is really fertile. Good commercial growers overseas do not consider 60 tons of barnyard manure per acre (about 28lb. per square yard) to be an extravagant dressing for chrysanthemums. They cultivate to a depth of 16in. and mix the manure throughout this depth to avoid leaving a soggy layer between subsoil and topsoil.

In the garden the soil should be deeply dug, working in a good dressing of animal manure or compost. At or before planting time a mixture of two parts of blood and bone and one of superphosphate should also be worked in at the rate of about 4oz. (a good handful) per square yard, and a dressing of lime at the same rate should be scattered on the surface and lightly hoed in.

Propagating New Plants

Border chrysanthemums are often left in the ground undisturbed for several years, but this does not produce the best results. Since the sturdiest growth and finest flowers are produced in the plant's first season, it is well worth while to put out new plants each year, and there are several ways by which plants can be raised.

In most districts the easiest method is to lift last year's roots in October, split them up, and select for planting those pieces to which rooted shoots are attached ("Irishman's cuttings"). These may be planted out at once, or grown on in a cold frame for a few weeks before being planted out. In the coldest districts chrysanthemums may be killed by frost if left in the ground through the winter, and to avoid this at least some of the roots should be lifted in the autumn and planted in a cold frame for the winter. Little water will be required until the roots show signs of growth in the spring, when they can be split up as described above, and the rooted shoots grown on in the frame, 4in. apart, until it is safe to plant them out.

While it is easiest to raise new plants by dividing last year's roots, especially if there is no cold frame, it is more satisfactory to raise them from cuttings, especially if a large number of new plants is required.

While cuttings may be taken in spring from last year's plants still in the border, many growers prefer to lift selected roots in autumn, after the old flower stalks have been cut down, and plant them in a cold frame or sheltered corner. These plants will then produce a prolific supply of cuttings early enough in spring to ensure well-rooted plants for planting-out time, and the border is left free in winter to be dug.

Only young shoots growing from below the ground should be used, since those growing from the main stem above ground level do not make satisfactory cuttings. When 1 to 2in. of the new shoots shows above the ground, draw the soil from around them, cut them off 2 to 3in. long, then replace the soil. To prepare the cuttings remove the bottom two leaves of each (preferably by cutting them off close to the stem rather than by pulling them off), and then with a very sharp knife or razor blade cut off the bottom of each stem just below the lowest joint (i.e., the place from which a leaf has been removed). Thin, very thick, or crooked shoots should not be used.

The cuttings should be dibbled 2in. apart either into the soil in the frame or into seed boxes filled with light, sandy soil. The dibbler should have a flat end, the hole for each cutting should be not more than 1in. deep, and the base of the cutting must be in contact with the soil at the bottom of the hole and not suspended in a pocket of air. The soil should be pressed firm around the cuttings, taking care not to bruise the stems, since this often causes the cuttings to rot.

Water the cuttings in with a watering-can fitted with a rose and then put the frame light on and keep it closed for a few days. If rooting is to be satisfactory, cuttings must not be allowed to flag, and a moist atmosphere in the frame will help to prevent them from flagging in the first few critical days. On bright sunny days it is wise also to lay a sheet of newspaper over the cuttings, but the paper should be removed in dull weather, and will be required only during the first 10 days or so.

As soon as the cuttings have rooted (shown by the bright, fresh green appearance of the leaves in the growing point) the frame light should be opened to give the plants some air during the day. If the young plants are coddled, or shaded too long, or grown too close together, or left too long in the frame, they will become weak and spindly, and will never make good plants in the border.

It pays to transplant the rooted cuttings 4in. apart in the frame, or into further seed boxes, as soon as their leaves touch. This move helps to develop a bushy root system, which aids the plant's recovery when later it is planted out in the garden. While in the frame rooted plants should be watered only when they really require it, since it is no advantage to encourage rapid growth at this stage.

About 10 days before planting out the top should be nipped off each plant on which side shoots have not already started to grow. Plants grown from rooted pieces instead of cuttings will by now probably be tall and leggy, and should be shortened to about 6 to 8in. high. Before they are planted out plants should have been hardened off by gradually removing the frame light altogether.

Planting Out

November is usually regarded as being the best time for planting out chrysanthemums in districts subject to hard frosts, especially when plants have been raised in a frame. In milder districts border chrysanthemums may be planted in late September or early October.

Five lighter blooms left of centre—Bullion: pure rich gold. Darker bloom top left—Haumoana: pink. Top and bottom right of centre—Rita Barker: pink rays, gold centre. Two blooms middle right—Miss Ethel Anderson: light bronze, anemone centre. Extreme right—Garcia: red front, gold reverse.

While commercial growers, of course, plant chrysanthemums in rows, it is preferable, in a mixed flower border, to put them out in clumps, each of three plants spaced about 15in. apart. This facilitates staking and ensures enough blooms at each clump to give it due prominence. In a large garden a border may be entirely filled with chrysanthemums, and when thus massed they are certainly seen to best advantage, but massed planting is not suitable for smaller gardens, since borders thus planted are too dull at other seasons of the year. It is essential to plant chrysanthemums firmly.

Staking

There are several satisfactory ways of staking chrysanthemums, and in commercial practice it matters little which method is used, provided the plants are given adequate support. In the garden, however, the staking system should be as unobtrusive as possible, yet must be efficient if the season's work is not to be laid waste by an autumn gale.

Probably the best method is to use sawn hardwood stakes, 1in. square in section and about 4½ft. long. These are expensive to buy, but are so durable and satisfactory that they will prove a good investment for this and other purposes. They are least conspicuous if painted dark green.

A stake should be driven into each position, and then the plant firmly planted just in front of it. Tie the main stem of each plant loosely to the stake, and as the side shoots grow each should be supported by a loop of raffia or garden twine, thus avoiding the lop-sided appearance so common in badly-staked plants.

When all the plants in each clump have developed their branching system the whole clump may be encircled with a stout tie knotted to the stakes to prevent it slipping down. Timely and adequate staking is an essential part of chrysanthemum growing.

Single chrysanthemum—Bullion: pure gold.

Summer Treatment

During the summer ground around the plants should be kept hoed, both to conserve moisture and suppress weeds. In long dry spells give the bed an occasional thorough soaking with water. It should not be neces-

sary to topdress the border if the soil was properly enriched before planting.

Stopping and Disbudding

There is no mystery about stopping and disbudding, although the home gardener is often confused by the terms. Stopping consists of pinching out the top of the growing shoot, while disbudding is the act of removing unwanted flower buds, usually the smaller ones, when about pea size, by pushing them gently sideways until they drop off. The effect of these operations, briefly, is as follows: Stopping causes several new shoots to grow just below the place where the stem is stopped. The more branches a plant has the more flowers it will bear and, within reason, the better show it will make in the garden, although individual flowers may be smaller. By disbudding, larger flowers can be produced, since the more buds are taken off the more food will be available for those which remain. On the other hand, heavy thinning of buds tends to shorten the total flowering period of the plant, since there will be fewer flowers still to open after the first ones fade.

When grown for show, where blooms must be at their best on a certain date, careful attention has to be paid to stopping and disbudding, each variety being given individual treatment. The varieties most suited for the flower border, however, do not require such detailed attention. It is usual to pinch out the tops before planting out (see above), and all branches may be stopped a second time by taking out their tops not later than Christmas. While this second stopping is not, perhaps, essential, it is worth while, provided the soil is rich enough to enable the plant to produce good flowers on the greater number of side shoots thus produced.

It is not usually necessary to disbud chrysanthemums grown purely for garden decoration. Many gardeners prefer to see the flowers grown as "sprays" (i.e., with all the buds left on), especially in the case of single varieties. If particularly fine blooms are required, the central bud should be left and the side buds removed. Some single varieties are best partly disbudded by removing all but the top three or four buds on each stem.

Varieties Recommended

There is a bewildering number of varieties from which to choose—a list of "chief commercial varieties" grown in the United Kingdom extends to nearly 300 names. Some varieties flower well into the winter in frost-free districts, but the later varieties will not, of course, flower out-of-doors in districts where early frosts occur.

Among the many varieties offered, the following are popular, with the single types becoming more and more favoured for garden decoration.

Single Varieties

Bronze Beauty: Medium-sized chestnut flowers.
Bullion: Large, pure gold flowers.
Garcia: Rich red petals with gold reverse and gold centre.
Catriona: Rich rose flowers; does well as a spray.
Lady Sargood: Red petals with gold reverse and an attractive gold "halo" round the yellow centre.
Peeress: Pink.
Desert Song: Bronze.
Mrs. Naylor Butler: Pastel pink.
Nancy Copeland: Orange; free flowering. Probably the best of the Korean chrysanthemums.
Lilian Hyslop: White flowers.
Roma: Red; good habit with flowers held well clear of foliage.

Anemone-centred Varieties

Miss Ethel Anderson: Light bronze.
Vernon Whittenburg: Red.
Stella: Pale pink.

Double-flowered Varieties

Cranford Yellow: Best if disbudded. Rather late for garden work in most districts.
Jean Pattison: Copper flowers. Grows well if not disbudded, but might be cut by frost in cold districts.
R. C. Pulling: Yellow.
Edith Cavell: Large chestnut flowers with gold reverse.
Blanche de Poitou: Pure white.
Pockett's Crimson: Crimson petals with gold reverse.

Dwarf Pom-pom Varieties

Ethel: Light bronze.
Mauve Lansdowne: Mauve flowers.

Diseases and Pests

One reason why chrysanthemums have to some extent gone out of favour is their liability to several diseases and pests, all of which can be kept in control by suitable treatment. This subject will be dealt with in a subsequent article.

Photographs by Photo News.

Some Garden Jobs for July

HERBACEOUS perennials which have been undisturbed in the border for several years should be lifted and put on one side while the ground is dug deeply and enriched with compost and a slow-acting fertiliser such as bone-meal. Then divide the old clumps and firmly replant as many roots as are required, selecting strong outside pieces for planting. The easiest way to divide thick, matted clumps is to put two garden forks back to back through each clump, and then split it into two by pulling the handles apart.

The following hardy herbaceous perennials which can be planted out now will give a bright display of flowers in late summer and autumn:—

Michaelmas daisies—Barr's Pink (4ft.), Red Rover (3ft.), King George (blue with yellow centre, 18in.).

Helenium—Riverton Gem (bronze, 5ft.), Moerheim Beauty (crimson, 3ft.).

Rudbeckia Newmani (yellow with black centres, 3ft.).

Red Hot Pokers—many good varieties, red, orange and yellow flowers, up to 4ft. high.

Coreopsis—Mayfield Giant (yellow, 3ft.).

Gaillardia—Mrs. T. Marriot and other varieties (gold and crimson flowers, 18in.).

Aconitum Fischeri (blue, 3ft.—poisonous to stock and human beings).

There is still time to plant ranunculus for late flowering. They will succeed only in a well-drained soil, since even temporary waterlogging makes them go yellow and die. A liberal dressing of compost worked into the border at planting time will help to produce good flowers. Ranunculus roots may be soaked in water for 12 hours before planting to encourage them to start into growth more quickly, and should be put in 2in. deep and about 6in. apart, with the claws pointing downward.

The following shrubs, which will flower on this season's new shoots, should now be pruned by cutting all the branches which grew last year back to within a few inches of the older wood: *Ceanothus* (deciduous types such as Gloire de Versailles), *Hydrangea paniculata* (but not varieties of *H. hortensis*), *Spiraea japonica* var. Anthony Waterer, *Clematis Jackmanii, Buddleia variabilis (Buddleja Davidii)*. Willows, dogwoods, and ornamental raspberries grown for the winter colour of their barks should now be cut back hard in the same way.

In mild districts bush roses may be pruned in winter, but in colder places the work is better left until the end of August or September. Various systems of pruning have been advocated, but in small gardens hard pruning is the best. All last year's shoots should be cut back to within an inch or two of older wood. Dead and weak pieces should be cut off altogether.

In course of time lawn edges become flattened out, broken, or overgrown. They should be trimmed now with a sharp spade or cutter, using a line for straight edges, but as little turf as possible should be cut off. Badly-broken places should be patched with new turves instead of cutting the whole edge back to the hollow places. If the edge is cut at an angle of 45 degrees, sloping away from the grass, it will be less likely to be broken down by peoples' feet. Hard frosts cause the lawn edge to crumble and in cold districts trimming is best deferred until chance of hard frost is past.

The Most Important Social Asset

TACT, sympathy, good manners, kindness, charm—these received many votes from readers as being outstanding contributions to social success, but the quality which overtopped them all is that described by the winner of the first prize, "C.V.W.," Waverly, Dunedin, as love and understanding of one's fellow-men. Second prize to "Celia," Marton, for her delightful little essay on courtesy.

First Prize

SOCIAL success can be attributed to so many qualities — personality, position, or accomplishments—that it is difficult to say which would be the strongest individual factor. My mind recurs to the most outstanding personality I have ever known, a woman of splendid character and wide experience. Judged by today's educational standards her attainments would not be considered great, but she had such wise understanding underlying a deep sense of humour that she was ready for all occasions. People came to her in joy and grief, success and failure, and were always sure of her ready sympathy and kindly help.

She herself had known much sorrow. Although she had seen husband, children, and fortune pass away, she never lost the high courage which she brought as a bride to a strange land. A daughter of Erin, her ready wit and keen judgment overcame many awkward situations. When she came to journey's end, rich and poor, Maori and pakeha came to pay tribute to the passing of a grand lady.

Many years have gone since the first summer petals fell upon her grave, but her memory remains green among those who knew her. The secret of her popularity lay in her great love and understanding of her fellow-men, in each of whom she saw the image of the Master she served so well.—**"C.V.W.," Waverly, Dunedin.**

Second Prize

"Of Courtesy it is much less
Than courage of heart or holiness . . ."

yet it ennobles and fills with grace the personality of everyone who possesses or cultivates this great social asset, be she queen or humble countrywoman. The courteous person will put others at their ease and consequently enable them to be at their best; so courtesy brings happiness and a flowering of the human spirit.

Courtesy is so much more than just "being polite," which is often such a shallow veneer to conceal our real feelings. It is a much warmer attribute, involving as it does a real caring for others and their feelings. This fine old word, one of the characteristics of the "verray parfait gentil knight," is similar in its French origin to the word "heart," and springs from the love in the heart of one individual for another—the same love which "suffereth long and is kind."

It is such an important social asset that one wonders whether there is not room for its greater cultivation; whether there could not be a greater courtesy between parents and children, customer and shop assistant, employer and employee, teacher and child. For where there is courtesy we may expect to find love, and where there is love there is greater understanding, and where there is understanding we will find an absence of friction and fear, and all this could well reflect on our whole national character. It is well said:

". . . It seems to me
That the Grace of God is Courtesy."

—**"Celia," Marton.**

Competitions

JULY

"Where I would like to live" is the topic for the July essay competition. Entries close on July 15.

AUGUST

A sense of humour is a great help in life. Many a difficulty can be eased, many a trying situation lightened, if you possess the saving grace of humour. How about recounting some of the amusing episodes which have fallen to your lot so that other folk, in reading of such experiences, may forget their worries for a little while and see the funny side of things.

"A HUMOROUS INCIDENT"

First prize, 10/-; second prize, 5/-. August 15 is the closing date.

MARY,
C/o "Journal of Agriculture,"
Box 3004, Wellington.

I THINK the most important social asset is kindness. If we are kind, we use tact, which is able to cover many a slip. We are able to forget ourselves and see other persons' point of view, and therefore are able to help them. Kind words are the golden rivets which help to hold together the splintered vase of human happiness. Kindness is the music of goodwill toward man, and on this harp the smallest fingers may play Heaven's sweetest tunes on earth.

Kind words accomplish more than hard speeches—they are like the sunbeams which, without any noise, made the traveller cast off his cloak, whereas all the blustering of the wind only made him bind it tighter about him.

"Kind hearts are the gardens,
Kind thoughts are the roots,
Kind words are the blossoms,
Kind deeds are the fruits."

To be kind and generous helps in any society.—**"Gran," Balclutha.**

I THINK one of the greatest social assets is adaptability. The woman who has a pleasant, easy manner can talk to the aged without making them feel old, can frolic with the young, chivvy the schoolboy, or merely be domestically middle-aged. She can listen to the garrulous, draw out the shy. To be able to discuss a subject intelligently or to give an opinion when called upon is indeed a social asset.—**"Milk Jug," Matangi.**

"ONE touch of nature makes the whole world kin." The natural human quality of a genuine interest in other people is the most important social asset. Such an interest brings forgetfulness of self, it means the possession of the cardinal gift of sincerity, it entails the art of bringing out the best in other people. What a help it is to be able to put oneself in the other person's place, to remember and tolerate the foibles of others, to forestall their wishes, to be always, as it were, "one step ahead"—the mark of a born leader.

The word "social" is derived from the Latin *socius*—"comrade." It is within the power of all of us to be true comrades by fostering that divine spark within us and by thinking of others—striving for that community spirit which makes the world kin.—**"Cloudy," Ashburton.**

HIGH in my list of important social assets I place personal charm. And by personal charm I mean that delightful quality which wins people's trust and has a platonic peacefulness that is quite as attractive to the sex of the charmer as to the opposite one. No matter what her age a woman of charm is attractive, whether she be 18 or 80. There is something so endearing about her that, wherever she goes and whatever she does, she gives those about her the happy feeling that they, too, are worth knowing.

To my mind this gift is such an asset that a person of charm has at her fingertips the means of dealing suc-

cessfully with whatever situation she is placed in. Although she is often quite unaware of it, by her personal magnetism she is able to persuade others to smooth over difficulties otherwise insurmountable. For her lovable qualities help her to make friends instead of enemies, and her happy knack of putting everyone at ease is truly a valuable social asset in itself.

—**"Tiggetty Boo," Kati Kati.**

I THINK that perhaps the most important social asset, especially in a small community, is tolerance, a broad-mindedness which recognises the rights and opinions of one's family and all who cross our path. So often friendships are broken and unhappiness caused by refusal to admit one's own mistakes. Though not condoning wrongdoing, a person who is tolerant in the widest sense of the word does not judge harshly. The love of our fellow-men which an open mind brings helps others to judge less hastily, too. In learning to acknowledge other people's rights we must often discipline ourselves in both speech and actions, and take time to think things out. We cannot say "Love thy neighbour" in one breath, and then make bitter and damaging remarks in the next.

Perhaps charity would be a better word than tolerance, because it seems to suggest giving what we have for the benefit of others. Is not this giving of kindly actions and thoughts what communities and countries need that we may live in peace? Faith is a close ally of tolerance, as I think it is very hard to behave with true charity when we have no faith in a person's ideals or character. The well-known saying "There's good in the worst of us, and bad in the best of us," is very true, and I am trying to teach myself to remember this before I condemn another whose motives I do not know.

—**"Manuka," Auckland.**

TO me, the most important social asset is to inspire confidence in others—that is, to help others to integrate their own personalities, to resolve their own inner conflicts and doubtings. Faith, hope, and charity (or love, as it is more correctly translated) are the "trinity in unity" to which we must aspire. Fortunate indeed is the man who has resolved, and fortunate, too, all those who come in social or business contact with such a person. Such people give out a radiance and beauty transcending the purely physical.

The ancient Greeks had a way of life almost approaching this ideal, though no community seems to have reached such a high plane since. But let us not despair, for we are each striving for that self-confidence which gives us a strength of purpose, a knowledge of life without which we cannot be socially useful. Our constant thought should be: "What am I giving to life?" not "What am I getting from life?"—**"S.J.M.," Whatuwhiwhi.**

AS the most important social asset I would unhesitatingly choose tact. It is really a composite gift, and perhaps not so much a gift as an acquisition, a training. How many children are born tactful? And what a lot of fun we should miss if they were!

But in the adult it is a priceless quality, transcending beauty and surpassing brains, embodying and enhancing kindness. Aided by a good memory and an understanding of human nature, it makes friends—and it keeps them. Without it the most beautiful person can be a plague, the cleverest a complete nuisance, and even the kindest so abrupt and awkward that until you discover their heart of gold you find them hard to please. In the presence of tact the shy and silent find self-expression, the doubting encouragement, and intimate friends harmony.—**"Wild Country," Te Pahu.**

CHARM heads a list of assets, such as sympathy, ease, and grace. To have charm a person must be well-mannered and well spoken. This is even more necessary than a sense of humour, for with the latter one must be generous enough not to hurt any other person. It has been said that if a woman has charm it matters little what else she has, but if she does not possess that essential asset it doesn't matter what else she has!—**"Black Beret," Waihi.**

"Let's bake a Cake without Eggs!"

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ROCK CAKES

1 breakfastcup flour, 2 dessertspoons sugar, 2-oz. currants or other fruit, 4-oz. butter (or dripping) ½-oz. candied peel, 2 teaspoons Edmonds Acto Cake Powder, milk to mix. *Rub butter into flour, add other dry ingredients, then sufficient milk to make a stiff dough. Place on cold greased oven shelf in rocky shapes. Bake in hot oven, 10-12 minutes.*

FRUIT CAKE

¼-lb. butter or good dripping, ¼-lb. sugar, 1 tablespoon golden syrup, few drops vanilla essence, 1-lb. flour, 2 heaped teaspoons Edmonds Acto Cake Powder, 4-oz. currants, 4-oz. sultanas, 3-oz. mixed peal, 1 cupful milk. *Beat butter and sugar to a cream, add golden syrup and essence. Stir in sifted flour and Cake Powder, mix to a nice consistency with milk. Bake in moderate oven.*

8.6

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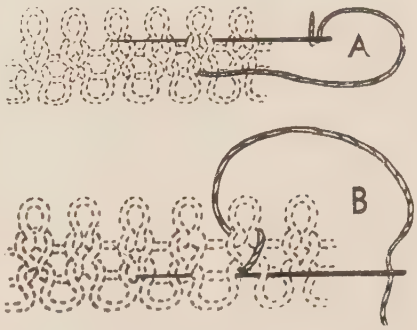
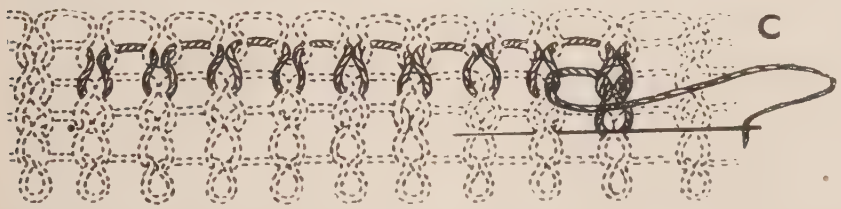
Mending Knitted Garments

By EVA TOPPING, *Rural Sociologist, Auckland.*

HAND-KNITTED garments should be examined periodically for thin places, holes, dropped stitches, and other damage. Here are several methods of repairing elbows and other parts which are thin or worn.

Swiss darning or "plating": This will be invisible if the mending wool matches perfectly and is slightly finer than that used in knitting the garment. A wool needle (like a crewel needle but with a blunt point) will be useful, as the point will slip between the loops with less risk of splitting the wool, or a darning needle can be used eye end first. Start at the bottom of the right hand of a thin place, on the right side of the garment. Pass the wool from the wrong side, out of the bottom of an "up" pair of the knitted loops. Set the needle in to follow the knitting so





Above—Fig. 1, A, B, C, Swiss darning. Below—Fig. 2, A, B, C, knitting stitch mend. Fig. 3—Blanket stitch mend.

that the first stitch makes half an "up" loop (Fig. 1, A), and the second stitch makes half a "down" loop and brings the needle out ready to start again on an "up" loop (Fig. 1, B), Continue along the rows of knitting a little way beyond the extent of the thin place; reverse the work and continue along the next row. (Fig. 1, C). A square or oblong darn is often made, but a less conspicuous repair results if the worker makes the shape irregular by putting a few loops more or less at the ends of the rows. A patterned or ribbed knitting will be easily followed after a little practice on a smooth fabric. Press the finished darn well, using a damp cloth and moderately hot iron.

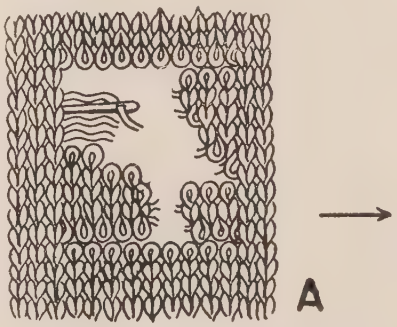
"Knitting stitch" mend: Where an actual hole has developed a "knitting stitch" mend will be less noticeable than an ordinary darn, and will "give" as much as the original knitting. Make two cuts one above and one below the hole, and run a thread through each set of loops so that they will not unravel any further. Thread each loose end of the cross strands and run it back into the knitting on either side of the hole on the wrong side. Next take a long piece of matching wool and pick up the loops, one at the bottom of the hole and the opposite one at the top alternately. Be careful to keep these zigzag stitches exactly the right length so that the finished mend will lie flat without either bulging or puckering. With a new length of wool, begin mending at the bottom right hand corner. Bring the wool from the wrong side through the first loop, round the two zigzag stitches, back through the first loop and into the second, ready for a new stitch. Continue along the row until the knitting is reached, then put the needle into the first loop of knitting, and out of the loop immediately above and start a second row of stitches back above the first row. Fill in the whole space, then press well, and the mend should be difficult to detect (Fig. 2, A, B, and C).

Blanket stitch mend: A blanket stitch mend is much easier and quicker to do, but the finished mend is more noticeable and has no "give." Prepare the hole by ravelling down a square patch as for the knitting stitch mend. Run in any loose ends on to the wrong side. Make a long bar from side to side of the hole and work blanket stitch over it and into each loop of knitting. Continue in this way until the hole is filled in, making one row of blanket stitch for every row of knitting (Fig. 3).

Ladders or dropped stitches can be mended with a crochet hook (Fig. 4). Darn the stitch in carefully where the bar has broken (a) to make sure that the surrounding stitches will not drop again.

Knitted-in patches: If the garment is very much worn under the arms

Knitting stitch mend.



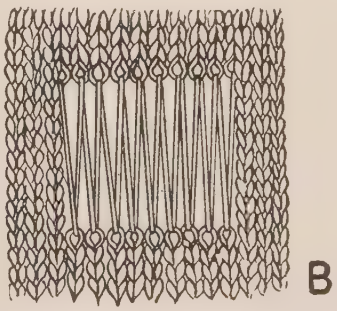


Fig. 2

Blanket stitch mend.

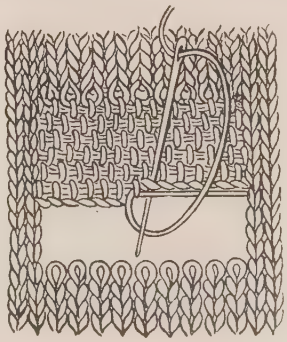


Fig. 3

or at the elbows, a new piece can be knitted in without undoing it entirely. Unpick the seams near the damaged part and pull out one strand at the top of the worn part. Pick up the top row of loops on a fine needle. Un-

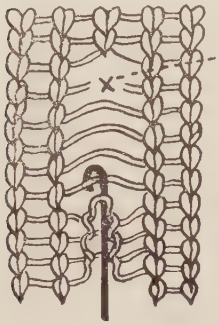


Fig. 4—
Mending a ladder or dropped stitch.

ravel the worn knitting and pick up the bottom row of loops on another fine needle. Knit in the patch on the correct size needles, making it wider than it was originally if the garment needs lengthening. If no matching wool is obtainable, the patch can be made in a contrasting colour, even several colours worked in stripes, or a Fair Isle pattern will look quite well. Graft the last row of the new knitting on to the stitches held on the fine needle, taking care not to miss any loops.

Reversing: Children's pullovers and jerseys often become thin across the front and at the elbows by the continual rubbing against school desks. If they are of the standard shape, they can be reversed to give them a new lease of life. Unravel the collar or ribbing at the neck, unpick the shoulder seams and the sleeve seams to a point in line with the front opening of the neck. Unravel the front down to the beginning of the neck opening and pick up the last full-width row of stitches. Continue the knitting, giving it the shape of the back. Pull down the original back to the point where the stitches will be divided for the front neck and reknit to make the front. Press the work at this stage, join the shoulder seams, and set in the sleeves again as formerly. They will be automatically reversed by changing the back to front of the jersey, and the worn elbows will now be in front of the arm. Press the sleeves well to remove any bagginess at the elbow. Pick up stitches at the neck, and reknit either a ribbing or collar according to the type of garment.

Broken stitches at the ribbing can be repaired by working a row of chain stitch along the edge of the knitting. Thread a darning needle with double wool for extra strength, and make one chain stitch over each stitch of the knitting. Do not make them too tight or the repair will not be sufficiently elastic, and will soon break. A crochet hook can be used instead of a darning needle, making the crochet stitches lie over the knitted edge in exactly the same way.

Lengthening the ribbing: Thread a darning needle with wool, and make vertical stitches over a knitting needle and into each stitch of the ribbing. Knit off on to a second needle when two or three stitches have been made, as it will be easier and more satisfactory than waiting until all the stitches have been picked up. Knit to the required length and cast off firmly, but without making the edge too tight. Press carefully on the wrong side (Fig. 5).

Disguising moth holes: If moths have damaged your jumper in spite of your precautions, darn all the holes very carefully then embroider a small flower, spot, or leaf shape over each darn. Add a few extra motifs to give a balanced effect. Embroidered jumpers are so popular just now that nobody will realise that your efforts are merely camouflaged darns! (Fig. 6).

Machine-knitted garments: When machine-knitted garments wear, darning and other repairs will generally prolong their life. Darn on the wrong side in the ordinary way, as the fabric is too fine and close for Swiss darning. A piece of net tacked into an elbow and used as the foundation for a darn is a great help and also serves to

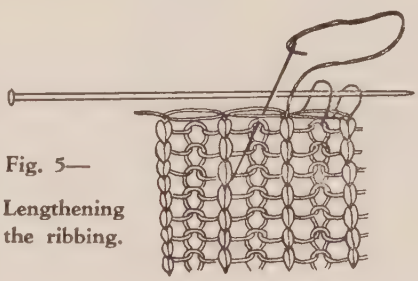


Fig. 5—
Lengthening the ribbing.

strengthen the weak place. Put small pieces of material or tape under pocket corners which have given way and stitch with matching silk thread right through the garment and patch. When the machine-knitted garments are too badly damaged for wear as they are, they may be remade into smaller articles of clothing. Don't be afraid to cut them, for by machining round the outline of the new pattern piece you will prevent the cut edges unravelling. Take care to have a suitable tension when machining; usually a fairly loose stitching will be right, for it must have as much "give" as the fabric, otherwise it will break.

Fig. 6—Disguise for moth holes.

Below—Details of decorations.

Large-sized cardigans or jumpers will make little jackets for children if they are carefully handled and cut. The seams can be joined by machine and then overcast with wool. The cuff edges of sleeves, hems, and necklines can be bound with braid or turned under and trimmed with decorative wool stitching. Don't overlook the possibility of adding hand-knitted ribbing at waist line, cuff, and neck line of a jumper made from a machine-knitted woollie.

Figs. 2 and 3 are reproduced from "A.B.C. of Mending," Farmers' Bulletin No. 1925, U.S. Dept. of Agriculture.

A LARK OF GOLD

A lark of gold in an amber mist
Soars to the moon with love untold;
A faery moon, by white clouds kissed,
And a lark of gold.
The silver waters lace and twist,
Caressing the sands; quietnesses enfold
The hills; and twilight comes slow to the tryst,
Gossamer-clad in a lavender mist,
In dewy darkness and melody cold.
Oh, night! Oh, tremulous beauty expressed
By a lark of gold.

SCRAP-BOOKS

I TAKE great pleasure in the making of picture scrap-books, writes "Barty," North Otago, and while it is true that the majority of these have been made for children, and it may be argued that to rouse a child's uncritical delight in such a gift is an easy matter, I might say that I have often debated whether the children of a household have found as much to absorb them in these books as have the adults.

EVEN this tiny inlet in the backwater of life has been rippled by the surge of war, for it is no longer possible to buy the well-bound books of firm, greenish-blue paper that was a pleasure to work with, for it showed up all the rainbow tints of scrap work so entrancingly, but the many-coloured pages of the scrap-books now procurable can provide charming effects, too, though somewhat more care must be taken in selecting the background.

Equipment

For the work a pair of fine embroidery scissors for straight lines and a pair of sturdy, rounded nail-scissors for "going round corners" are essential to satisfactory cutting out; a powder paste from the paperhanger's (it has the advantage of leaving no smear if it gets on to the page where it shouldn't); a good round brush (a stencil brush is excellent); a fair stock of patience (and what work worth doing does not require it?), and you may be prepared to find enjoyment in your work.

Almost the whole of the material for scraps for my books has been provided by advertisements, and, as can be understood, the overseas magazines with their superb colour printing are the joy of the picture scrap-book maker's heart. For a time there was a dismal tendency in the commercial world to turn to pure camera work, reproduced in black and white, for advertising, but now, although a great deal of wonderful photography is used, there has been a glorious return to colour and a combination of photographic artistry with pencil and brush work that provides riches for the "scrapper's" scissors.

Grouping Pictures

The best results can usually be obtained by selecting a good central picture for each page and grouping round it smaller scraps that may be related to the theme of the main picture, or be purely decorative, and in that these particular magazines provide so much by way of exquisite little scenes or tiny groups of figures that add to interest and colour. For instance, a picture of a small boy whittling a toy boat can be surrounded by cut-outs that "make live his dreams"—a lovely sailing ship on the horizon, a cowboy on a bucking horse, a pirate slipping into a cave, an explorer plodding towards the Pole Star. A picture of some beautiful foreign scene can have a frieze of howdahed elephants, or a Javanese pagoda, or Russian domes.

Things Not What They Seem

One Christmas magazine provided a delicate Dresden china figure apparently swooning at the sight of a long-legged modern maiden smoking a cigarette, whereas she had originally been expressing rapture over the presentation of a bouquet of flowers by an ardent and poetic lover.

A little girl, hurrying homeward with a basket of groceries, too prominently displayed someone's breakfast cereal packet, and had her basket turned into one of fruit—if no fruit or flowers in correct proportion might be available, little snips from orange, lemon, leaf-green, purple shades make just as good oranges, grapes, and anything else that the mind might fancy.

Children, too, delight in recognising everyday things, a collar-stud, a dome, a hair-clip, and to search for and paste in these little clippings adds much to the make-up of the book. The clipper soon develops an "eye" for material.

Then children like to see the well-known in unusual circumstances and the chick that "has never scratched yet" riding on a truck or an "Old Dutch" apparently out to chastise Donald Duck can provide great amusement.

A scrap-book—a large-size one—made for an adult friend proved a surprisingly-appreciated Christmas gift, and, although the suggestion had been made that it could be passed on to a small relative when its novelty was outworn, when I visited the North Island years later I found it still filled an honoured place in entertaining and amusing guests, and the work of about twelve months in selecting and harmonising subjects and colour appeared well spent.

While for children "colour schemes" do not need to matter so much, there is no doubt that children's sense of form and beauty can be trained by helping them admire rich, clear colours and charming pictures, as well as find amusement in the bright pages.

POEMS AND PIECES

I AM very fond of poems and pieces, and I, too, have a scrap-book like "Snowy's." It is well read in our home, as different pieces suit different thoughts. Here are some I particularly like—if we could live up to them it would make life much easier for many of us.

A THOUGHT FOR THOSE WHO WORK WITH US

Don't forget the one word that leavens up all efforts, all strivings. It is Encouragement.

Remember, all kicks and no pats breed heart-breaks, but a word of praise is like a day in spring—fresh, invigorating, and inspiring.

HAPPINESS

Jes' keepin' happy
Is a fine thing to do;
Lookin' on the bright side
Rather than the blue.
Glum or sunny musin'
Is largely of our choosin',
And jes' bein' happy
Is brave work and true!

Thank God for what you have,
Ask Him for what you need,
And don't grumble.

—"Tup," Ashburton.

I WAS most interested in the samples from "Snowy's" scrap-book, as both my sister and I keep one. These are a few of my favourites:—

Your life, it lies before you
Like a path of driven snow.
Be careful how you tread it
For every step will show.

Real happiness is cheap enough, yet how dearly we pay for its counterfeit. —Ballon.

A word spoken in season, how good it is!—Solomon.

Child, shall I tell thee where Nature is most blessed and fair? It is where those we love abide. Though that space be small, ample is it above kingdoms; though it be a desert, through it runs the river of paradise, and there are enchanted bowers.—Ibn Ahmed Attar.

Who can paint
Like Nature? Can imagination boast
Amid its gay creation, hues like hers?
Or can it mix them with that match-
less skill,
And lose them in each other, as
appears
In every bud that blows?

—"Skylark," Ohakune Junction.

LIKE "Snowy," I, too, have a scrap-book of odds and ends. Anything which takes my fancy, be it poem, picture, or joke, is stuck into it. Here are a few items picked out at random:

Life is a jest, and all things show it,
I thought so once, but now I know it.
—John Gay.

Little deeds of kindness, little words
of love,
Help to make earth happy like the
heaven above.
—Julia A. Fletcher.

How doth the little busy bee
Improve each shining hour
And gather honey all the day
From every opening flower.

—"Romulea," Upper Hutt.

BOOK-MARKS

LIKE "Cloudy," I gather what gems I find while reading books and I am grateful for the items she has brought to my notice. Recently I was reading "Gone Rustic," by Cecil Roberts, and came upon this line—"Butterflies in noonday hours are disembodied souls of flowers." I think it was Browning who, having once known the powerlessness of mere words, wrote: "Fancies that broke through language and escaped."

It would be rather a nice idea to mount the shorter samples of "Cloudy's" scrap-book on little leather book-marks. What would be more appropriate than W. H. Davies's words, "My walls outside must have some flowers; my walls within must have some books." Anyone handy with pokerwork tools could fashion these book-marks. I have made several out of cardboard, inscribing them with favourite lines, and they afford me endless pleasure. Every time I pick up a book they remind me of the wisdom and joy to be found in its pages.—**"Native Flower," Waipukurau.**

FROM AN OLD SCRAP-BOOK

The flag they followed overseas
Floats silently o'erhead,
Soft blows the poppy-scented breeze
Above our heroes dead.
From all the cruel, bitter pain
Their souls have found release
And now, amid the growing grain,
They lie, in perfect peace.
Snow white, in many a serried line,
The little crosses stand,
Each cross a grave, each grave a shrine
Amid an alien land.
Their part through flaming, shrieking war
Was bravely, nobly done;
For us to keep for evermore
The peace that they have won.

—Sent in by "Ronivat," North Auckland.

TREASURES FROM MY SCRAP-BOOKS

I, TOO, keep a scrap-book. In fact, I have several, each holding its own particular interest. The "Journal" is the largest contributor to my literary one. Most of my entries are hand-written, as I dislike cutting into books which I keep and lend. Another scrap-book holds newspaper cuttings and photos of people, places, and events. It also contains a record of the history of our school, including its jubilee; original contributions by friends; and an "In Memoriam" section.

One book is comprised solely of articles on stamps; another deals with embroidery and handicrafts, and there are others devoted to gardening notes or recipes. My collection of Walt Disney cartoon stories, featuring the adventures of Donald Duck, Pluto, Snow White, etc., is greatly enjoyed by my little nephew when he comes to stay.

For many years I've been collecting "bits and pieces" about anything that takes my fancy. Here are a few treasures from my scrap-books which I would like to share with you:—

HEALING

The wind walked on the water—
Oh, delicate the trace
Of dimpled patterned footsteps
Upon its quiet face.
The wind walked on the water—
I looked far into space,
And breathed a still thanksgiving—
Oh, lovely act of grace,
When winds that walk on water
Shall dry a tear-wet face.
—C. McEwan.

Evil is wrought by want of thought as well as want of heart.—Hood.

The chimes of Big Ben are set to:—

All through this hour,
Lord be my guide;
And by Thy power
No foot shall slide.

The freedom of the human soul is the essence of religion.—Earl Baldwin.

Kindness has resistless charms.—Rochester.

The value of time.
The success of perseverance.
The pleasure of working.
The dignity of simplicity.
The worth of character.
The power of kindness.
The influence of example.
The obligation of duty.
The wisdom of economy.
The virtue of patience.
The improvement of talent.
The joy of originating.

Our dead are never dead until we have forgotten them.—Author unknown.

—"Clara Jane," Rakaia.

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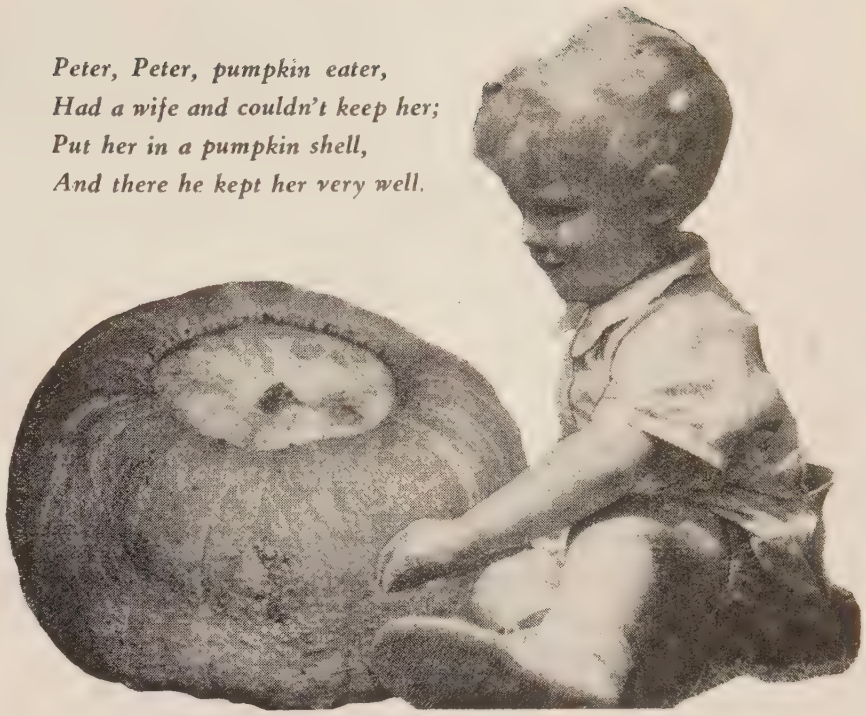
PUMPKINS

By
EVA TOPPING,
Rural Sociologist, Auckland.

Peter, Peter, pumpkin eater,
Had a wife and couldn't keep her;
Put her in a pumpkin shell,
And there he kept her very well.



PUMPKIN usually plays a humdrum role on our tables. It appears baked as an accompaniment to roast meat, boiled or steamed, in pieces or mashed, and once in a while it is used for a pie filling. There are other ways of serving pumpkins, and while they are plentiful you may like to try your hand with some of these recipes for soups, sweets, and savoury dishes culled from many sources.

WHERE the recipe calls for cooked pumpkin, left-over pieces of steamed or boiled pumpkin can be used, or if none is available, prepare fresh pumpkin. Peel and cut into convenient-sized pieces and remove the seeds. Boil until tender in a small amount of salted water; about 20 minutes is usually sufficient. Drain and mash to a smooth pulp; cool before using. About 3lb. of raw pumpkin will yield two cups of cooked, mashed pulp.

PUMPKIN SOUP

2 cups cooked pumpkin, 1 medium-sized onion, 2 rashers bacon, 1½ teaspoons salt, pepper, 1 teaspoon curry powder, sprig of thyme, 1 pt. stock or water, ½ tablespoon chopped parsley.

Peel and slice onion thinly, cut up bacon into small pieces, and fry together in saucepan until lightly browned. Add the cooked, mashed pumpkin and the rest of the ingredients except the parsley. Replace lid and simmer gently for ¾ hour. Remove the thyme and add the parsley just before serving. Vary the flavour by omitting the curry powder and adding tomato pulp instead.

Pumpkin fritters.

CREAM OF PUMPKIN SOUP

2 cups cooked pumpkin, 2 small onions, 1oz. bacon fat or dripping, 1 pint water and 1 pint milk or 1½ pints water and ½ pint milk, salt and pepper, 2 eggs, grated cheese, chopped parsley.

Chop the onions finely and fry to golden brown with the fat in the saucepan. Add the cooked pumpkin, water, and seasoning. Simmer for ½ hour. Beat the eggs, add the milk, and pour into the soup, stirring well all the time. Heat for a few minutes to cook the eggs, but take care not to let the soup curdle. Add the grated cheese and chopped parsley just before serving.

PUMPKIN FRITTERS

2 cups cooked pumpkin, 4oz. flour, 1 teaspoon baking powder, pinch of salt, 1 egg, frying fat.

Sift the flour, baking powder, and salt. Add the beaten egg and the pumpkin. The mixture should be slack, so add a little milk if necessary. Heat the fat in frying pan until a faint blue smoke appears. Put spoonsful of mixture into the pan and cook first on one side and then the other until the fritters are golden brown and cooked all through. For a sweet sprinkle with a mixture of cinnamon and sugar and serve hot. These fritters can be made for breakfast, served with bacon, and fried in the dripping left in the pan after cooking the rashers.

PUMPKIN PIE

Short crust pastry to line deep pie plate or sandwich tin.

1½ cups cooked pumpkin, 3oz. sugar, 1 cup milk, ½ teaspoon ground ginger, ½ teaspoon cloves (ground), ½ teaspoon cinnamon (ground), ½ teaspoon nutmeg (ground), or 2 teaspoons mixed spice, 2 eggs.

Line a pie plate with pastry, prick over the bottom, weight with dry crusts and bake—or cover an inverted sandwich tin, prick over, and bake upside down until cooked. Remove from outside of tin and put on baking sheet when filling is added. Add spices, sugar, and salt to pumpkin and mix thoroughly. Beat the eggs and add with milk to pumpkin mixture. Turn into the prepared pastry shell and bake in a moderately hot oven till the filling is set, about 30 minutes. Sprinkle with fine sugar and serve hot.

APPLE AND PUMPKIN TART

Short crust pastry to line sandwich tin or pie plate.

1 cup cooked pumpkin, ¾lb. raw sliced apple, ground allspice, 2oz. sugar.

Fill the cooked pastry case with alternate layers of thinly-sliced apple and mashed pumpkin. Sprinkle each layer with sugar and a very little ground allspice. Make the top layer apple. Bake in a hot oven until apple is cooked, about 40 minutes. Serve hot, sprinkled with sugar.

BAKED, STUFFED PUMPKIN

Cut a pumpkin in half across the seeds, not lengthwise through the stalk. Wash but do not peel. Scoop out the seeds and fill with a savoury stuffing. Place in a meat tin with generous amount of dripping and cover with grease-proof paper. Bake in moderate oven for 1½ to 2 hours till the pumpkin is quite tender. Serve with good brown gravy.

Savoury stuffings can be varied to suit the ingredients on hand; any of the following are suitable:—

Pork sausage meat with onion, sage, and breadcrumbs. Serve with apple sauce and gravy. **Ham or bacon**, chopped onion, and breadcrumbs, moisten with stock, milk, or white sauce, season with thyme and parsley. **Fresh minced meat** with onion and potato. Cover with sliced tomatoes during the last stages of cooking. **Left-over meat** minced with potato, carrot, leek, or any other vegetable; moisten with gravy. Sprinkle liberally with chopped parsley just before sending to the table.

Pumpkin pie.

Pumpkin small cakes.

PUMPKIN SMALL CAKES

1 cup cooked, mashed pumpkin, 1 cup sugar, ⅓ cup butter or mild-flavoured dripping, 2 large cups flour, 2½ teaspoons baking powder, 2 teaspoons mixed ground spices (cinnamon, ginger, nutmeg, or others), pinch salt, vanilla essence, lemon essence, or grated lemon rind, ½ cup chopped dates, ½ cup chopped walnuts, if procurable, or other fruit.

Cream the fat and sugar, mix in the pumpkin, spices, and flavouring. Sift the flour, baking powder, and salt, and add gradually. Drop teaspoonsful of the mixture on oven tray and bake about 15 minutes in moderate oven. Nuts and dates are particularly good with these little cakes, but other fruit can be used if obtainable.

The cakes are nicer the day after baking than when fresh and keep moist for several days if stored in a tin or covered vessel. No egg is required and the proportion of fat is small.

[Illustrations by Sparrow Industrial Pictures Ltd.

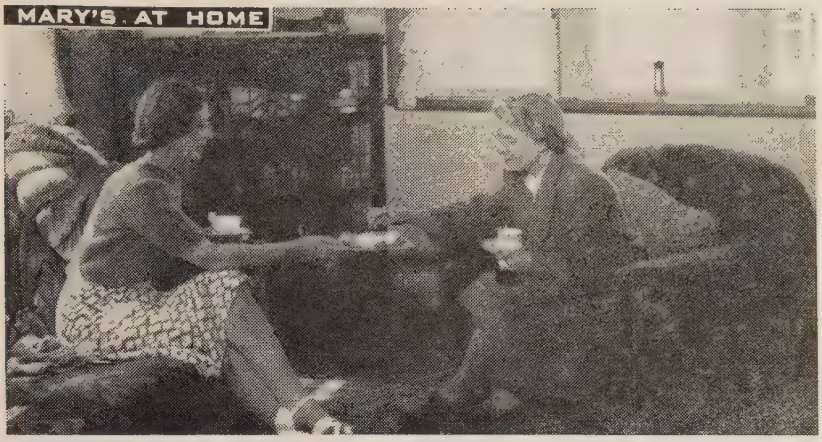
Thoughts on Friendship

Friendship is the highest degree of perfection in society.—Montaigne.

So long as we love, we serve. So long as we are loved by others, I would almost say we are indispensable, and no man is useless while he has a friend.—R. L. Stevenson.

If I mayn't tell you what I feel, what is the use of a friend?—Thackeray.

Amongst true friends there is no fear of losing anything.—Taylor.



LIKE most of your readers I love my garden and wish I had lots more time to spend in it. But with four young "brats" the days go by far too quickly. I do enjoy your pages—they seem to be more interesting each month.—**"Mary Lou," Shirley.**

I WOULD like to be one of your band. Perhaps some of you will know the old song, "The Rowan Tree"—I do not know who wrote it. The first verse runs:—

O rowan tree, O rowan tree,
Thou'll aye be dear to me;
Entwined thou art o' mony ties
O' hame and infancy.
Thy leaves were aye the first o' spring,
Thy flowers the summer's pride.
There was na' sich a bonnie tree
In a' the kintra side.

A lovely tree, the rowan, and the berries are also good for jelly, especially when mixed with raspberries. I wonder if any rowans are grown in New Zealand.

—**"Rowan Tree."**

THE paragraph by "Honeysuckle Rose" on beauty made me think of my small boy who, when I pointed out the beauty of a golden - yellow gladiolus, remarked, "Well, Dad says you can't eat them." Isn't that men for you!

—**"Double Dee," Tuakau.**

WE have a small farm here, milking four cows and keeping fowls, ducks, and calves. We also have a flower and vegetable garden. Where we now live we get a great view of green fields which we love.—**"Garden Lover," Eltham.**

MAY I join your happy band? I have read your pages with keen interest and think they are a great help to all women who read them. The competition entries are really fine.—**"Busy Bee," Northland.**

WE arrived on our farm in the middle of the drought and found the one and only house-tank empty and the stand fallen over. The tank itself was upside down in the shed and full of holes. "Boy" worked hard to mend it, but then we had to wait for the drought to break. The rain saved the grass, which had dried almost to nothing, and I couldn't sleep that night for sheer happiness in listening to the water drip, dripping into the tank.—**"Lonely Londoner," North Auckland.**

ISN'T it nice to meet other "Good Neighbours" in your pages and hear of their interests? Here is a verse to cheer you:—

When our souls are much discouraged
By the roughness of the way,
And the cross we have to carry
Seemeth heavier every day,
When some cloud that overshadows
Hides the Father's face from view,
O! 'tis well to remember
He hath blessed us hitherto.

—**"Peggy," Pleasant Point.**

THE article on school lunches was most helpful, as well as the one on renovating dresses. I wonder if it would be at all possible before winter has gone to include an article on making winter coats. They are very expensive these days. I believe they are not beyond the skill of the ordinary needlewoman if she knows exactly how to go about the intricate parts of interlining, padding, etc. I must add how I love the pictures of New Zealand scenes you've included lately. Ours is such a beautiful country that we can never tire of it.—**"Tiggetty Boo," Kati Kati.**

AS a new contributor I want to express my appreciation of the "Journal" as a whole and your pages in particular. We are sheepfarming on a place which can almost be described as "one man plus," being just too big for one alone and not large enough for two all the time. Isolation is due to access and not to distance from the main road, and after the first period of wishful thinking in the direction of visitors I devoted my time to making a garden and having our home as attractive as possible, both inside and out. When feeling a bit "down" pottering in the garden works miracles. Seedlings intrigue me. Every now and then I discover seedlings of some plant long believed lost. Recognition of these has become comparatively easy now. Surprises come my way, too. A beautiful yellow autumn crocus appeared among a row of blue muscari—how it got there I don't know.—**"Mrs. R. S.," Wairoa.**

MAY I join the happy circle? I do enjoy the "Good Neighbour" section and would like to contribute sometimes. Like "Snowy," I, too, have a scrap-book. All sorts of little odds and ends are included in it. May I pass on a few?

"THE HOME BAROMETER"

Not at Stormy, oh, forbear,
Woman dear, to set it there.
Nor at Rain; for sages say
That is just a coward's way.
Change? But that perplexes so
When the wind veers to and fro.
Well then, every single day
Set it Fair, and let it stay.

Back of the loaf is the snowy flour,
Back of the flour, the mill,
Back of the mill is the wheat and the shower,
And the sun and the Father's will.

Father,
If only I could see the difference
Between the really big and little things.
I do not ask for better or for more,
I only ask for this: God keep my soul
From growing petty.

—**"April Chicken," South Canterbury.**

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I FEEL I must write and tell you how much I enjoy the "Good Neighbour" section, especially the opening pages. It was while glancing idly through a "Journal" that I noticed the photo of a room and wondered what on earth it was doing in an agricultural magazine. I then read with much interest of your "dream come true," and turning the pages, found all the other articles. I now pounce on the "Journal" as soon as it arrives. It is nice to feel that one can write of little incidents in the garden or home and know that they are appreciated by other readers.

I can visualise the many pleasant hours spent gazing from your window, as I know the views of which you speak. Wellington is my home town and I've climbed many a hill and sometimes taken the elevator to the highest roof-top to gain a better glimpse of the beautiful harbour and surroundings. Those are the views I miss now that I am so many miles away from town, but I find that the hills and trees here and the quietness of the countryside are a consolation after the noise of the city.—**"Green-eyed Beauty," Feilding.**

THE recent fight to save our farm and the thousands of acres of valuable bush beyond took me back to the terrible night of the Raetihi fire in 1918. My husband and I, together with our four children, escaped to an open field which was bound on one side by heavy forest. The wind was coming towards us and hot grit and smoke made it almost impossible to breathe. I was afraid for my baby and small children and I prayed as never before. Although the sky was a brassy red and the stars were shining and there was no sign of clouds, suddenly I felt a spot of rain. I could scarcely believe it. My husband said, "It's beginning to rain," and it kept on and then the wind changed. The fires burned for weeks, but we were saved. We found a tank which the tornado had carried away, so we got into it and stayed there until rescued by neighbours three days later. Their house had escaped, but the farm had felt the full force of the terrible fire and stock lay dead everywhere.—**"Vee," Kati Kati.**

THE longer evenings have come round now and open fires burn cheerily. We are having rain and our part of the world certainly looks wintry. Yesterday some of our pines were being topped. It is horrid to see the beauty of a tree being mutilated, but because of the nor'-west gales, symmetry must be sacrificed. When we were gathering up the pine cones we thought of the people in town who would appreciate some of them. It is wrong for wood to go to waste. We always use the small branches that are chopped off first. We fill the fireplace with such branches, apply a match, and the air becomes fragrant with the pungent smell of pine. The smoke billows up the chimney in thick, soft puffs and drifts in a blue-grey haze skywards.—**"Cloudy," Ashburton.**

MY elder son, aged 9, is a "Journal of Agriculture" fan and "pinches" it at the earliest opportunity. He is intensely interested in the scientific side of farming and is a mass of information—and advice!

—**"Catriona," Hamilton.**

YOUR letter on hills appealed to me tremendously. I have climbed all the hills and the one mountain in our district. I once had the opportunity of climbing several well-known parts of the Blue Mountains in N.S.W. It was marvellous to see the billowy clouds below you gradually rise to give you breath-taking views.—**"T.A.," Paeroa.**

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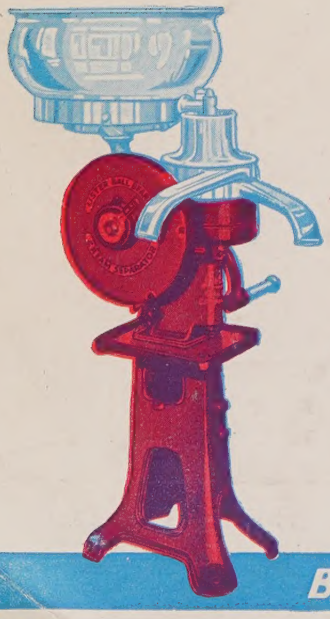

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